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MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XLIV. | DETROIT, MICH., MAY 15, 1920. | Third Series, Vol. XXXVI, No. 5.

ORIGINAL COMMUNICATIONS.

A LARGE URETERAL CALCULUS REMOVED THROUGH THE OPEN-AIR CYSTOSCOPE.

BY HOWARD A. KELLY, M.D.,

Emeritus Professor of Gynecology in the Johns Hopkins University, Baltimore.

I am anxious that the value of the direct open-air method of cystoscopy should not be lost sight of in this country, where it originated some twenty-seven years ago, and, pursuant to this wish, present the following case, which well sets forth its directness and simplicity, hoping to interest the readers of the THERAPEUTIC GAZETTE.

The open-air cystoscope, which views easily all parts of a bladder, which is posturally distended with air, is in every way superior in women, and often in men, to the more cumbersome indirect methods of inspecting the distorted bladder through lenses and prisms, and a fluid medium, often rendered turbid by the discharges; a method, too, often painful owing to the forcible distention of an inflamed bladder, which has to raise the superincumbent viscera as the watery fluid is injected (see Fig. 1).

Let the following case tell the story of a simple natural aërocystoscopic diagnosis and treatment:

Mrs. E. was referred to Dr. Curtis F. Burnam and myself by Dr. J. G. Garrett of Baconton, Ga., November 22, 1919, for the investigation of a distressing burning pain on urination, with pains in the urethra and bladder, troubling her for some twelve years past. She is forty-three years of age, has been married nineteen years, without children or miscarriages. At the onset of her present trouble some blood passed the urethra for two or three weeks. She has had no pains in her loins, but an occasional backache. Latterly pain in the pelvis had become constant, sometimes keeping her awake all night. The urine on examination has a specific gravity of 1020, is alkaline, contains a flocculent sediment, yields a dense cloud of albumen, and is loaded with pus cells in clumps.

Her present main complaints are the frequency of urination and irritation, and the voiding at night, sometimes every few minutes. She was first seen at the above date, and the various investigative and operative procedures were instituted and carried out promptly, first by Dr. Burnam, and then by myself.

Cystoscopic examination in the knee-chest posture through the air-distended bladder showed a vesical interior, which as a whole was smooth, and no trace of inflammation. In the region of the right ureteral orifice a black area 1½ cm. in diameter was seen projecting through a distended orifice, and behind this there was a bulging of the base and lateral wall, forming an egg-shaped tumor; the mucosa covering the swelling was normal. The prominence covering the swelling could be lifted on the end of the speculum and rolled over and felt solid like a stone, and on tapping the dark body with the end of the speculum it was at once determined to be a large ureteral calculus impacted at the

extreme lower (vesical) end of the ureter. On palpation in the dorsal position the stone, just seen through the cystoscope, could readily be detected and appeared to be about 1½ cm. long and 1 cm. wide. Dr. Burnam then had an *x*-ray picture taken (see Fig. 2), which showed a large stone on the right side, evidently either in the bladder or lower ureter. The right kidney, somewhat low, but of normal size, was free from calculi, and the left kidney and ureteral areas were normal.

The next step taken by Dr. Burnam was to place the patient again in the knee-chest posture, introducing a No. 10 cystoscope to distend the bladder and expose the stone, thrusting its nose through the ureteral orifice; then taking a small, sharp knife on a long handle he incised the orifice where the stone projected in a backward direction, cutting through both vesical and ureteral mucosæ for a distance of about 2.5 cm. (1 inch). He then introduced a vesical alligator forceps, and grasped and tried in vain to pull the stone out. The patient was allowed to rest for about an hour, when the stone extruded itself spontaneously, as shown by an *x*-ray taken then (see Fig. 3), which showed it lying in the bladder.

On November 28 I examined her, at Dr. Burnam's request, and, in the dorsal position, bimanually found a hard mass in the left vaginal fornix, moderately tender, and somewhat movable, but not to be rolled across to the other side of the bladder. The stone to touch seemed to me to be about 2.5 cm. in diameter. It lay in advance of the position of the uterine pelvic organs and of the cervix. I then put her in the knee-chest posture, and introduced a No. 11 open-air cystoscope. As soon as the light was directed within (see outline drawing, Fig. 4) there came at once into view a beautiful, large, rough, ovoid calculus, lying in the right vertex of the bladder. Using the end of the speculum as a measure I determined the size to be 2.5 x 3.8 cm. Introducing alligator forceps I tested the consistency of the stone; though firm to touch with the end of the speculum, it was really friable, and could be broken up with

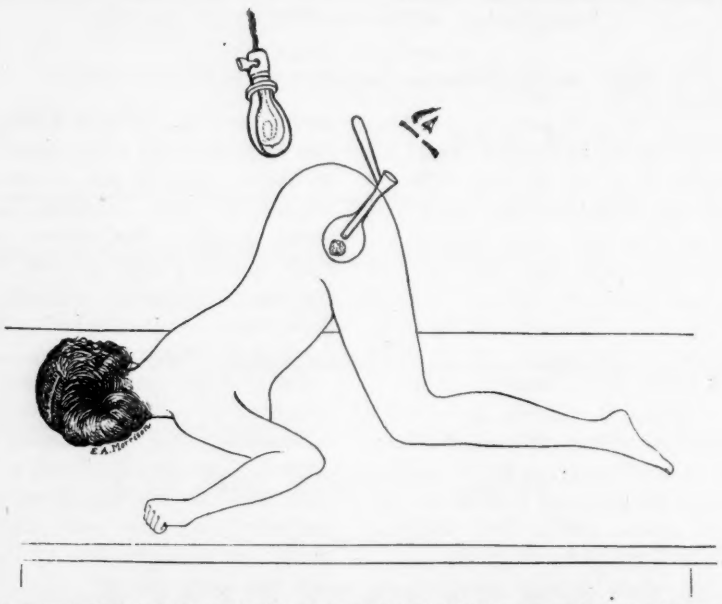

FIG. 1.—The general principle of the examination of the air-distended bladder through the open speculum: A horizontal table, or one with foot end raised; the posture of the patient with chest as close as possible to table, head turned to one side to faciliate this; the speculum introduced—the bladder then at once spontaneously expands with air; the electric light held close to sacrum; the reflecting head mirror and the eye of the observer.

FIG. 2.—The large calculus in the right ureter. I can only account for the transverse position of the stone by a rotation of the ureter.

FIG. 3.—The calculus after the incision through the stretched-out ureteral orifice, and its escape into the bladder. It is turned here with one end toward the observer.

patience. I began, therefore, at once to gnaw through it with the forceps (see Fig. 5), breaking off larger and smaller pieces, and removing them (see Fig. 6) without any discomfort at all to the patient, until at the last the entire stone was discharged as a coarse débris. A few days later I looked in again, and finding a few scales about 1 cm. in diameter and 2 mm. in thickness, I removed these also. The method used to wash out the bladder was, as I had her in the knee-chest posture, to pour in from a pitcher some warm saline solution, say about half a pint; then withdrawing the speculum until the vesical end lay within the bladder near the internal urethral orifice, I directed the patient to raise herself quickly to a squatting posture, when the water was discharged in a sudden gush, bringing with it the granular detritus (see Figs. 7 and 8).

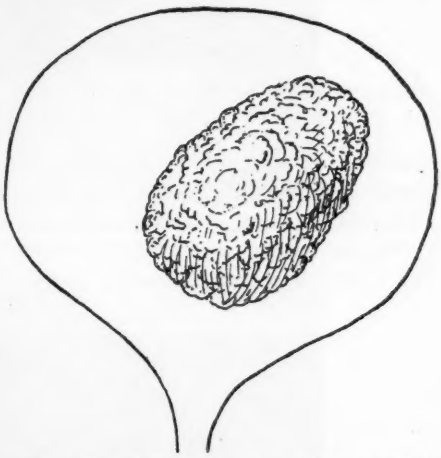

FIG. 4.—The calculus as I saw it looking through the cystoscope into the bladder. One can see how easy it is to measure it by using the known diameter of the end of the speculum as the unit of measure.

Two kinds of forceps were used to get rid of the stone: a narrow pair with mouse teeth to cut through it, and a duck-bill to remove the larger detached pieces.

Mr. Fred. West, our associate in the Chemico-Physiological Laboratory, makes the following report of the analysis of the stone, which shows that it consists mainly of calcium oxalate and uric acid:

"Examination of renal ureteral vesical

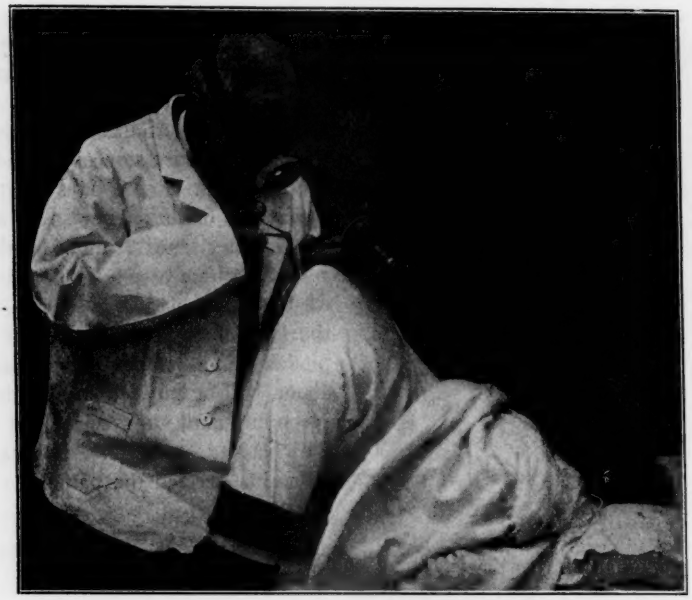

FIG. 5.—The operator reflecting the light down the speculum into the bladder and biting into the calculus with an alligator forceps.

calculus. Weight, 11 grammes; color, grayish-brown. Tests made—(1) nitric acid yielded typical alloxantin, ammonium hydroxide formed ammonium purpurate; (2) hydrochloric acid with heat dissolved about 50 per cent of a fragment; warmed with excess of sodium acetate, calcium oxalate was precipitated in bulk, hence calcium oxalate present; (3) addition of sodium hydroxide liberated ammonia gas

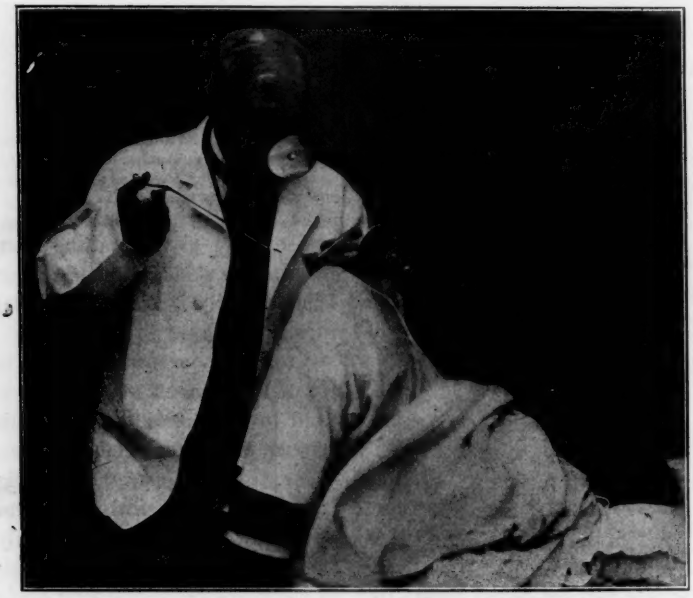

FIG. 6.—A bit of the stone removed in the grasp of the forceps; in this way all the larger pieces were extracted, almost without the patient feeling it.

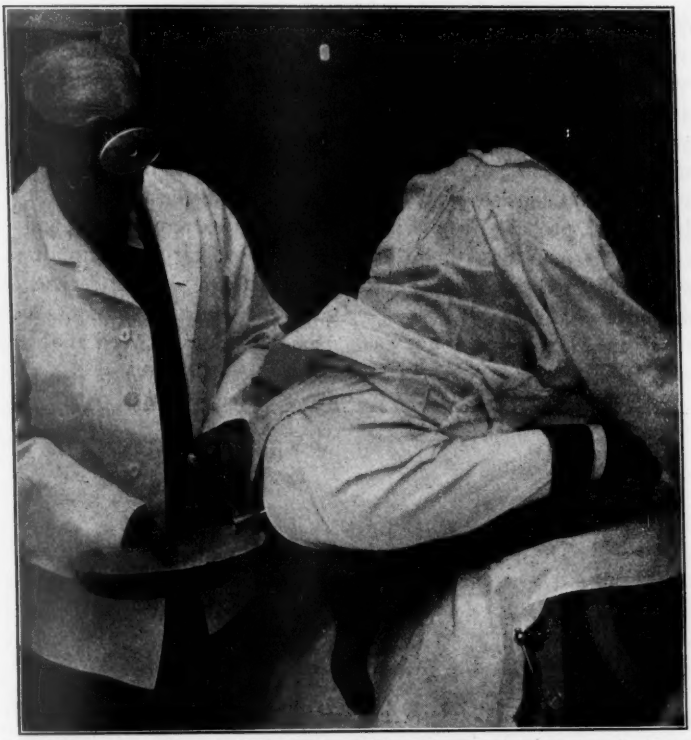

FIG. 7.—The bladder was filled with water in the posture of Figs. 1, 5, and 6, and then the patient raised up quickly discharging the fluid and the accumulated fine sand with it.

FIG. 8.—The débris removed from the bladder both by breaking up the stone and extracting the larger pieces seen here with forceps, and by washing out as just described in Fig. 7.

as shown by hydrochloric acid on glass rod, hence ammonium biurate present; (4) the effervescence with hydrochloric acid suggested calcium carbonate, and ammonium oxalate gave typical precipitate, hence calcium carbonate present. Conclusion: the calculus in the main consists of calcium oxalate and uric acid, probably in alternate layers. In smaller quantities there are also present calcium carbonate, ammonium biurate, and phosphates."

The relief given by the operation was immediate and great. A slight reddening of the bladder and abrasion cleared up entirely in three days.

In this way, and by these two simple operations—(1) the slitting of the ureteral orifice, and (2) the biting through and removal of the débris, all under direct inspection—an operation of magnitude was performed without an anesthetic. In so far as the effect upon the comfort of the patient was concerned, it amounted to little more than an ordinary specular examination, while entire relief was secured from a distressing condition. Not only was the patient thus relieved of her immediate discomforts, but she as quickly escaped the more serious danger of a right pyonephrosis, the loss of the function of the kidney, and a possible nephrectomy. The few small instruments used are seen in Fig. 9.

The following then are some of the advantages of the open-air method of examining and treating the bladder and catheterizing the ureters:

1. It is extremely easy and can be done in the ordinary routine of a morning's examinations, without serious loss of time.

2. It is direct and not indirect, there being nothing between the stone and the eye of the operator but the atmospheric air.

3. The instruments employed both for investigation and the operation described are few and simple, and not expensive.

4. At the examination the affected area can be touched and palpated, as well as seen, and accurate measurements can be made with the end of the cystoscope.

5. It is equally easy, with a biting forceps, to remove a piece of any tissue for microscopic study in suspected malignancy.

6. Catheterization of a ureter is as easy as inspection.

7. The removal even of a large foreign body, as in the case described, may be extremely easy.

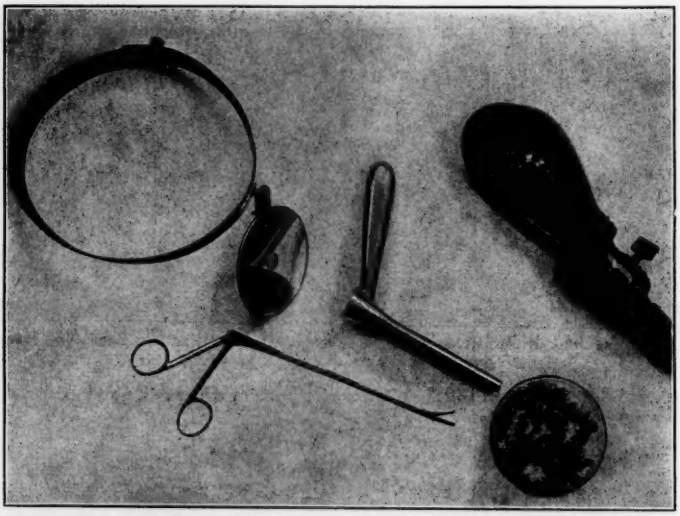

FIG. 9.—The few simple instruments, besides the eye of the operator, used in discovering, breaking up, and extracting the large ureteral-vesical calculus.

YEAST THERAPY IN ARTHRITIS DEFORMANS—A PRELIMINARY REPORT.

BY WILLIAM H. SPENCER, M.D.,
Instructor in Laryngology in the Jefferson Medical College of Philadelphia.

That distressing condition of the joints and periarticular structures termed arthritis deformans, and known to the laity as "rheumatism," is now generally considered a result of focal infection. The older hypotheses of nervous and metabolic origin have failed in substantiation, while many are the reports of improvements following the clearing up of some chronic infective process. The teeth, tonsils, nasal accessory sinuses, ear, appendix, gall-bladder, and intestine have individually been incriminated. So far has the pendulum swung and so frequently have the teeth been at fault, that some practitioners are accused of advising reckless extraction of teeth with the promise of cure of the arthritis, without looking for other possible sources of trouble. Little thought seems to be given to the digestive disturbance apt to follow the improper chewing of food from the sacrifice of these organs of mastication. Similar lack of study has led to the removal of many tonsils with like disappointing effects in regard to the cure of the joint condition, but with certainly less detrimental effects on the patient.

We have found the observation of the following case most instructive and interesting:

Mr. A. K., aged seventeen, had enjoyed good health with the incidents of the usual childhood diseases until the age of thirteen, when he was seized with a polyarthritis which confined him to bed for two years. At the end of this time he was able to move about the house with the aid of crutches. He continued in this condition for two years longer, avoiding any except most necessary movements because of the pain incurred. The temperature had been continuously elevated, ranging between 99° and 102° F. Physical examination at this time, after four years of illness, showed a fairly nourished and developed boy with slight cyanosis of the lips and finger-nails, and marked dyspnea on slight exertion. The ears, teeth and nasal sinuses were normal, but the tonsils were large and their crypts filled with inspissated accumulations. No lung abnormality existed. The heart, however, was greatly enlarged to the left and somewhat also to the right. There was a heaving precordial pulsation and a distinct presystolic thrill over the base. Loud, rough to-and-fro murmurs replaced the heart sounds, a diastolic murmur in the aortic area being most sharply marked. The head nodded at each heart-beat, and the waterhammer (Corrigan), Quinck, and pistol-shot pulses were present. The systolic blood-pressure was 118 while the diastolic was read at 24, although the pulsations could be heard to the zero mark. This feature has been pointed out by Prof. H. A. Hare as a valuable diagnostic sign in aortic regurgitation. Abdominal examination revealed no evidence of disease.

Both wrists were flexed by tendon contraction, and periarticular thickening prevented any motion. The right elbow was held in partial flexion by bony ankylosis. Both ankle-joints were swollen and stiff; passive motion produced a leathery crepitation with great pain. Both knees were swollen, stiff, painful, and creaky. The right hip was fixed in partial flexion, but some motion in the joint could be made by the examiner. The temperature was 102° and pulse 130. Urinalysis showed a trace of albumin and a few hyaline casts. The blood Wassermann was negative.

Because of the very evident tonsillar disease it was considered that here the focus of infection was apparent and the indications for treatment clear. The dyspnea, cyanosis, and continued fever were, however, contraindications to any immediate operative treatment, so that efforts at improving the general condition were begun. Continued movement of the joints both passive and active was urged in spite of the pain. Small doses of sodium bicarbonate were also given, and the tonsillar crypts treated with a 3-per-cent iodine solution. After four months of this

treatment, however, no marked improvement followed, and the temperature continued to range between 99° and 102°, the pulse varying from 96 to 130. At this time constipation became annoying, and the patient was given one yeast cake thrice daily after meals. A laxative effect was obtained and the bowel action became normal.

It was now observed that the general condition began to rapidly improve, the dyspnea subsided, the joint action became freer and less painful; temperature and pulse fell to normal. After three months of the yeast treatment with active and passive motion of the joints, the patient was able to walk without crutch or cane, he took an office position in which he typed all correspondence, carried all messages, and incidentally is learning mechanical drafting. He often walks eight miles a day and climbs three flights of stairs without pain or discomfort. The ankle- and knee-joints have quite recovered. The motion of the right hip-joint is excellent, although there is still some limitation of flexion. The wrists are becoming straighter and more mobile, but the right elbow remains unchanged. The heart has returned almost to normal size, and of the murmurs there remains only a systolic roughening at the apex. From an invalid, the boy has become a self-supporting member of society.

It is quite evident that in spite of the very apparent tonsillar disease the real focus of infection was in the intestinal tract, and that the improvement in all probability resulted from the influence of the yeast on the intestinal bacterial flora. Tonsillectomy is to be done, however, for these tonsils are potential of much harm and may be the source of a relighting of the joint condition if allowed to remain.

In three other milder cases of arthritis deformans, in older patients, we have observed definite improvement in the joint conditions and a lessening of pain on motion under yeast therapy.

CONCLUSIONS.

1. There may be more than one focus of infection, so that careful study should be made of each case before conclusions are drawn and promises made.

2. Definite improvement has followed the administration of yeast in all of the cases of arthritis deformans studied, and remarkable benefit resulted in one case.

3. Yeast therapy in arthritis deformans deserves further trial. The results in cases so treated should be reported so that an accurate determination of its possible value in this trying disease may be determined.

1830 South Rittenhouse Square.

OVARIAN GLAND THERAPY.

BY A. N. CLAGETT, M.D.,

Professor and Head of Department of Gynecology, Illinois Post-Graduate Medical School; Professor of Clinical Gynecology in Loyola University Medical School; Attending Gynecologist to West Side Hospital, Chicago, Illinois.

There is a distinct relation between ovulation and menstruation, but the manner in which this is effected was in doubt. Pflüger finally established a theory that the swelling of the ovary caused an irritation which was transmitted along the sympathetic to the nerves of the uterus, bringing about menstruation. This theory was more or less upset by Gnauer's experiment. He removed the glands from animals and planted them in the abdominal wall. Collateral circulation was established, the glands lived, and menstruation continued, though by this means the nerve circuit had been cut. We, ourselves, during the last eleven years, have transplanted in twelve cases an ovary from one woman to another, one who had had both ovaries removed with complete cessation of menstruation and violent climacteric phenomena. In all of these cases the graft lived, menstruation was reëstablished, but the graft in every case was absorbed between five and eleven months. We have had to remove both

ovaries for diseased conditions, and by careful search were convinced that there was no accessory ovary or other ovarian tissue remaining. We have taken a piece of fairly healthy ovarian substance and buried it in the fat over the rectus abdominis. In these cases of autogenous grafts they have persisted as long as seven years, though some have been digested at the end of two or three years. Watching these grafts at the time of menstruation the skin would feel hot and tender, and the graft would appear to be swollen two or three times its size during the interval.

The deduction from all this is that there must be a juice, extract, hormone, or by whatever name it might be called, existing in the ovary and carried to the uterus by the circulation. A furtherance of this view is obtained by watching the action of the corpus luteum. The corpus luteum of menstruation persists only for a part of the time between the menstrual periods, and is thought to prevent menstruation during the time it exists. It is noted that the corpus luteum of pregnancy is many times larger than the corpus luteum of menstruation and it persists for months, we having even observed it in several cases of Cæsarian section done at full term. This is most probably the reason why the average woman does not menstruate during pregnancy. The flow of blood would naturally lead to abortion, and it is nature's plan to prevent both menstruation and abortion by means of the persisting corpus luteum. Some women vomit more or less during the early stages of pregnancy. They rarely vomit after the fifth month, the reason for this being that the corpus luteum sometimes develops slowly and does not put sufficient hormone into the blood to counteract the disturbances due to the growing ovum. It has been well noted that if the corpus luteum be damaged or removed before the third month of pregnancy inevitable abortion occurs, though laparotomy for needed conditions may be undertaken with very complete safety, in the pregnant woman, provided the corpus luteum be not injured, handled roughly, or, best of all, not disturbed. Other gland juices affect menstruation. Overactivity of the thyroid gland, either by its increased normal secretion or by its toxin, may diminish or cause the menstrual flow to cease, and on the other hand we have relieved the symptoms of Graves's disease by administering ovarian substance to the patient, showing that these two glands seem to have an inhibitory action each upon the other. Also the ovarian secretion seems directly to affect the sexual function. Women almost without exception are more sexually active around the menstrual period when the corpus luteum is at its lowest grade, and the other ovarian substance at its highest activity. It is usual for a woman from whom both ovaries have been completely removed to be more or less sexually apathetic, or the appetite may be completely lacking. The same thing obtains before puberty, after the menopause, and should the ovaries have become more or less destroyed by disease. This has led to the thought that it is wise to separate the ovary into its different parts and to give treatment in various conditions by means of these different extracts.

Through the Department of Experimental Medicine of Parke, Davis & Company we have been supplied with these various hormones. We have used the entire ovarian extract in cases in which the ovary seemed to be completely lacking. We have used the corpus luteum in cases of emesis and hyperemesis gravidarum. The relief has been remarkable. An ampoule has been given once and, in severe cases, twice daily, paying due attention to the blood-pressure. We have found it necessary to give from six to fourteen doses, the later ones being administered every third day. Relief of the nausea and vomiting has been marked within a few days. In five cases in which the only alternative was to empty the uterus to save the patient's life, vomiting ceased; the patients who in the average had lost about 25 pounds in about two or three weeks went on to normal and uneventful delivery. We have used corpus luteum in cases of menorrhagia with very good results. We have administered an ampoule

once every three days over a period of several months, and have had these patients establish and maintain a normal menstruation. Parke, Davis & Company, after making an extract from the whole ovarian substance, separated the corpus luteum from the rest of the ovary and prepared an extract from this ovarian residue. A happy thought, for herein is contained the active principle of the ovary without the inhibitory juice of the corpus luteum. We have employed this ovarian residue in ampoule form in cases of oligomenorrhea and sexual inactivity. It has been successful in both instances, causing a marked stimulation.

We recall the case of a doctor's wife sent to us, complaining that while she used to be very active sexually she had now no orgasm, and for the last two months no sensation at all. We gave her an ampoule of ovarian residue on the 17th of April, 1918, also one on the 20th, and she reported condition improved. On the 24th of April, and on May 2, an ampoule was given, and the report was "very good indeed." May 6, 9, 12, and 20, an ampoule was given, and patient came in very happy, reporting conditions perfectly normal. On the 8th of June patient came in very angry and reported herself pregnant.

Figuring out that the corpus luteum and thyroid extract both seem to inhibit the menstrual flow, we believe that the ovarian residue would be indicated in exophthalmic goitre, though as yet we have not tried it out. To summarize, then, we would say that corpus luteum is indicated (1) in the vomiting of pregnancy, in threatened abortion, and menorrhagia. (2) That ovarian substance should be used in wasting diseases causing ovarian destruction, or following surgical removal of the glands. (3) Ovarian residue tried out in exophthalmic goitre, in scanty menstruation, and diminished or lost sexual activity.

25 E. Washington Street.

PAIN AND DISCOMFORT IN THE AGED AND THE RATIONAL RELIEF THEREOF.

BY THOMAS S. BLAIR, M.D.,
Chief, Bureau of Drug Control, Pennsylvania Department of Health, Harrisburg, Pa.

"An arctic night and an arctic day age a man more rapidly and harshly than a year anywhere else in all this weary world," said Kane, the great explorer; and an arctic life, with the latter half of it dark and dismal, as so many lives are, ages a man or woman, adding psychological age to physical senility, faster than will actual disease borne cheerfully.

One can hardly tell which is the worse, pain or discomfort; but in advanced age pain is torture and discomfort is pain. Would that the young could know this! Cruelty to children is deplored, but much of cruelty to the aged is condoned and misunderstood. Strange, indeed, it is that with age ever before us we understand so little of the feelings, fears, and fretfulness of the aged!

In the aged reflex action is retarded and the reflex protective mechanism often fails to act in time, imposing danger and disaster. The regulating centers are weakened, especially that of heat regulation, which is readily disturbed; also the respiratory center is readily deranged. The vasomotor center is unstable. Automatic activity, such as sphincter control, becomes sluggish in the aged. On the whole, then, vital energy diminishes and functional activity and capacity are retarded or partly lost and exhaustion is readily induced. Drugs that influence the centers must be conservatively used in the aged patient.

Quinine in full dosage depresses the respiratory center in the aged and readily irritates the cerebrum. Even iron in full doses may depress the central nervous system of the aged person more readily than it will in the young. Arsenic should not be given to the aged person with a low blood-pressure, and digitalis must be

avoided in the aged person with a high blood-pressure, whatever may be said of its action in this regard in youth or middle age. Amyl nitrite may cause asphyxia in the aged and paralyze the respiratory center, and the more slowly acting glyceryl trinitrate is to be preferred to it. Antimony has a bad effect upon the respiratory center in the aged person. The acetanilid group of drugs influence the heat centers too much to be safe in the aged and may induce collapse. Morphine, bromides and hydrated chloral may produce the Cheyne-Stokes breathing in the aged more readily than in the young, and apomorphine may induce sudden collapse in aged persons. Salicylates in full dosage may induce dyspnea from central action in the person of advanced age.

We know the dangers of general anesthetics on the aged, but we do not realize that hydrated chloral may be as dangerous, as may also cocaine. Never forget the two facts that opium is a direct poison to the respiratory center, and that the respiratory center is readily influenced by toxic agents in the aged. Children and the aged accept opiates poorly, and never forget that many cases of diarrhea and dyspnea in the aged are often occasioned by the unwise use of opium and morphine.

These drugs must be conservatively used in old age largely because of their marked influence upon the vital centers.

Especially should it be noted that many cases of so-called asthma in the aged are really nothing more than dyspnea. Morphine is given for it, and if its use becomes habitual the dyspnea may be aggravated and finally come from central irritation induced by the secondary action of the drug. A fresh dose relieves for a time, owing to the primary action of the morphine, but it soon returns. Also it should be noted that chronic diarrheas in the aged are often really the result of too much administration of opium or morphine. The physiological action of opium explains both of these phenomena.

The ego impresses itself in the aged, leading to introspection and self-centeredness. Moroseness is common, as well as unreasoning perverseness. Sexual power diminishes. Mentality is apt to be perverted and warped. Added to physical weakness and the gradual retirement from the center of his own little stage in life, the aged person gives rein to his imagination. The general result is unhappiness and a tendency to look on the dark side. Some become hypochondriacal, others unduly sensitive, and others very neglectful of themselves. These persons crave "some sweet nepenthe" to make them forget and to sleep. They are bad company to themselves, so they huddle off in some corner and mope. They blame all of this discomfort and unhappiness on physical disease, either real or imagined, and they fall ready victims to the alcohol or medicine bottle. Aged persons are apt to take too much medicine, often most unwisely. If the physician mistakenly gives them narcotics they soon get to like them, and their latter estate is worse than the first. A surprisingly large proportion of drug addicts are aged people, and they are most difficult cases to treat successfully.

Many discomforts in the aged come from normal physiological changes. Do not mistake these changes for disease and thus be induced to medicate the aged person for conditions drugs assuredly cannot help. Functional changes occur in the lungs before a person passes fifty years. Shallow breathing is normal to the aged person, and the air capacity diminishes at the rate of about 1½ cubic inches per annum and the amount of CO_2 expired diminishes about one-third by the time a person reaches seventy-five years of age. Blood-pressure changes markedly, being high as long as a compensatory hypertrophy is maintained, and then it may fall below normal. Functional activity in the kidneys diminishes quite normally in old age. The heart sounds are somewhat altered and must not be mistaken for disease. Blood changes and metabolism in the aged have never been adequately studied. This is a factor we cannot ignore. Slight albuminuria does not indicate much in the aged person, as

interstitial changes occur in the kidney without the person having a clinical nephritis. Colonic changes and more or less stasis are to be expected. The brain changes are complex, brain-fag being common. The aged person needs sleep at more frequent intervals than most physicians realize. The special senses fail very normally in the aged, and senile atrophies inevitably occur sooner or later.

The hygiene of the aged needs special study and attention, and no amount of medication can take the place of a well-regulated life. The theory that narcotics support life in the aged is very much overstated. Sometimes they do so act, and life may actually be prolonged by administering them, as in the perverted metabolism of saccharine diabetes; but if metabolism is normal, narcotics simply depress it and may actually shorten life. Undoubtedly morphine slows perverted metabolism as well as normal metabolism, and if the perverted metabolism dominates the normal metabolism morphine may prolong life. Just where to draw the line in any given case is difficult to determine.

This brings us to the question of pathological old age, and here I draw somewhat upon the writings of Nascher on geratics. Natural senility may simulate disease, and on the other hand real pathology in the aged may be largely devoid of definite symptoms, as instanced in senile pneumonia.

But we are here more particularly interested in pain and discomfort in the aged. Pain is an uncertain symptom in old age and is very frequently of the referred type, hence the pathology productive of pain may be hard to trace. Contrary to common belief, the aged suffer less pain from septic and inflammatory diseases than do adults of fewer years. Even gangrene produces little pain in very aged persons. Hyperesthesia is apt to be more aggravated in the aged than in the young, especially pruritus. Sometimes herpes zoster is exceedingly painful in the aged. All physicians know how a diseased bladder causes torture to the aged man. It is common to find a gastric ulcer on post-mortem with an aged subject, and yet the disease may have been unsuspected on account of the absence of pain.

We know little of the action of drugs as modified by the senile organism and degenerating tissues. Indeed, the primary action of a drug in the usual dosage may be almost *nil* in the aged, while the secondary action may be marked. Drugs have almost no action on the senile kidney. Drugs are slowly absorbed in the aged, especially tannin-bearing drugs, but cumulative effects may occur rather unexpectedly. Pills may lie inert and undissolved in the aged, the dosage is pushed, and suddenly we have a dangerously toxic effect. This may occur with opium or morphine pills and the patient die of narcotic poisoning. An aged man in Perry County, Pennsylvania, was accustomed to eating a pound of gum opium every two months. Evidently most of it was never absorbed, as he was dangerously but not fatally poisoned by laudanum. Digitalis is very apt to be cumulative in the aged. Atropine acts slowly in the aged, and where atropine is given with morphine in order to stimulate the respiratory center against the depression of the morphine it is well to give the atropine first by hypodermic injection and the morphine by mouth, or inject the morphine later. The ordinary hypodermic tablet of morphine and atropine may be very dangerous in old age.

Sedatives and hypnotics are rarely required in old age, though they may appear to be. The aged person is apt to sleep so much by napping in the daytime that he may be wakeful half of the night, and he thinks he is suffering from insomnia.

Much of the so-called pain in the aged is merely the fear of pain, or simple tenderness may be described as pain. A disagreeable placebo may cure many a "pain" in aged persons. There are cases of definite disease which are painful in all persons and naturally so in the aged. These cases may really require opium or morphine.

Senile tremor is aggravated by the

bromides. Calomel and bismuth are too insoluble to give to aged persons. The digestive ferments are of little value in the aged. Ointments for the aged should have a fatty base of animal character, as the vegetable and mineral oils are not absorbed by the aged skin, or very slightly and slowly absorbed. Never give cold baths or use the ice-bag with very aged persons, as the shock is too great.

Senile debility is a concomitant of many diseases in the aged person, and it may include labored breathing which passes as asthma, stiffening of the joints which may be mistaken for chronic rheumatism, and even senile tremor which is thought to be serious nervous disease. Medication does little for such cases and may do harm. Tonics and stimulants may be indicated, never depressing or narcotic drugs. Strychnine, phosphorus and small doses of arsenic may be indicated, while coffee may do a great deal of good.

Opium and its educts are often prescribed under the belief that they are mental restoratives valuable in senile debility. They are *not* mental restoratives, simply producing more florid ideas, as Nascher well expresses it. Cocaine is dangerous in the aged, as it has a deleterious effect on arteriosclerosis. The discomfort due to senile debility needs psychic and physical treatment more than medication.

Much discomfort in aged persons comes from arteriosclerosis, and the symptoms may be legion in this protean condition. The treatment depends on circumstances, and each case must be carefully studied. It must ever be remembered that the disease may be secondary to other affections as well as the result of advancing years. Drug treatment, aside from relief of underlying disease, is merely symptomatic, while regulating the life is supremely important.

Much so-called heart disease in the aged is due to faulty diagnosis, giving the patient the impression that he has serious valvular trouble, and he exaggerates the dyspnea and the symptoms of the senile heart into vital affairs. These cases are usually overmedicated, often with narcotics in excess. There is no doubt that morphine is often indicated in serious valvular lesions, but it is not indicated in the merely senile heart.

Pain may not be as severe in senile cardiac lesions as it is in earlier life. In senile cardiac hypertrophy there may be headache, vertigo, and tinnitus, and the main aim is to maintain compensation. Cardiac dilatation may give rise to severe distressing cardiac asthma.

Valvular lesions in the aged are very apt to be combined ones. Senile aortic regurgitation gives rise to precordial distress, but aortic stenosis occasions, often, severe pain with pressure symptoms. Mitral regurgitation causes cardiac asthma and a feeling of weight and pain, with headache; but mitral stenosis is painful only in the later stages. Tricuspid regurgitation gives rise to cyanosis, and the patient must often sit propped in a chair to sleep.

In senile valvular lesions the treatment need not include drugs so long as compensation is well maintained. When compensation begins to fail absolute rest does more good than does medicine, and small doses of arterial sedatives are more valuable than is digitalis. In fact, digitalis is dangerous in senile conditions. Carbonate of ammonia and camphor serve well in such cases. Nitrites are indicated in some cases of dyspnea, but must not be used continuously. In severe attacks of dyspnea morphine following atropine may be necessary. Rarely should morphine be given alone in the aged; it depresses respiration. Heroin is a respiratory poison the administration of which is never excusable in an aged person under any conditions, least of all in cardiac disease. Another drug to be rigidly excluded in senile conditions is hydrated chloral. Veronal may, however, be administered safely in senile insomnia associated with cardiac lesions.

Cardiac asthma occasions very manifest distress and pain in the aged. It is commonly relieved by compound spirits of

ether and the hypodermic use of atropine. In severe attacks, never in mild ones nor in the intervals, morphine supported by atropine may be highly necessary.

Morphine is unwisely used far too often in the treatment of cardiac asthma. Legitimately used it is invaluable in emergency, but if we allow the aged asthmatic to become addicted to morphine we lose it wholly as a remedy to meet severe attacks; it becomes an agent to which he is enslaved and is of no effect as a remedy in his case. Most of the aged sufferers from cardiac asthma are certain to become addicts if we supply morphine for them to take according to their own judgment, for they take a dose at the first sign of dyspnea or distress. It is even unwise to leave any quantity of the drug with members of the household, for they almost invariably use it without discrimination, and even persons who are not ill may make use of the supply. In far too many families the aged person is regarded as a burden; they do not want to be bothered with the old man or woman, and they are perfectly willing to keep the patient quiet by dosing continuously with narcotic drugs the person needing their every care and loving sympathy.

At base, aside from cardiac dyspnea, it is senile emphysema that causes dyspnea in the aged in most cases. A warm and dry climate is the best cure.

The cardiac neuroses are the occasion of much distress to aged persons. Palpitation is often due to gas distending the stomach, and treatment looks to the removal of the cause. Bradycardia comes with increased arterial tension or results from certain nervous diseases. Tachycardia sometimes gives rise to precordial distress. Adams-Stokes disease is a form of arrhythmia with epileptoid attacks, and it is a frequent cause of sudden death in the aged. There are other types of arrhythmia not so dangerous but nearly as distressing. These conditions require atropine rather than morphine, for the latter drug may do harm. Symptomatic treatment is important. Angina pectoris is a far more painful affection than any of those just mentioned, the common remedies being too well known to require discussion, and here the emergency use of morphine and atropine is fully justified and may even be life-saving.

Senile bronchitis is catarrhal in type and is common in old people who are housed in overheated apartments. An equable climate does more to afford relief than does any form of medication. Florida and Southern California are recommended. Chronic laryngitis is also a cause of distress and discomfort. The winter cough of the aged is a chronic hypertrophic bronchial catarrh and may end seriously, even in gangrene of the lung. The treatment of these conditions need not be entered into except to say that the only narcotic indicated is codeine. Yet atropine may do more good, especially if there is reason to fear pulmonary edema.

A true bronchial asthma is rare in the aged, despite the fact that it is a very common diagnosis. Cardiac asthma is not rare, and there is a true senile asthma. Most cases called asthma in the aged are really dyspnea. The iodides often do senile asthma a world of good and narcotics are justified only during severe attacks.

Pleurisy is usually mild in the aged. Pain is best relieved by local applications, narcotics being seldom needed.

Senile bronchitis has been mentioned, but an acute bronchitis may occur in the aged similar in type to that encountered in younger persons, though it is usually milder and gives rise to little or no pain; but there is an infectious form with marked pain and which may develop into an infectious bronchopneumonia. These cases may require the administration of codeine. Heroin is dangerous therein. Pain may also be relieved by the application of dry heat. An acute laryngitis in the aged may also require the administration of codeine to allay irritable cough. Chronic laryngitis may give much discomfort from hyperesthesia, which may be relieved by a ten-per-cent spray of orthoform. In spasm of the larynx a whiff or two of chloroform gives relief.

Bronchial stenosis is a serious affection which causes very marked dyspnea or even

asphyxiation and may finally require surgical attention.

Bronchial and laryngeal troubles in the aged should never be neglected or put off by the prescribing of a mild narcotic as a routine treatment. They need careful study and intelligent care, as these cases allowed to drift along may eventuate in senile pneumonia, which is not noticed until signs of cyanosis or pulmonary edema arise and the case be hopeless.

Active pulmonary hyperemia is rare in old age, but pulmonary congestion is frequent, causing dyspnea and a distressing cough but no severe pain; but the patient may finally die of pulmonary edema and exhaustion. Narcotics are contraindicated, expectorants and hyperemia treatment being applicable.

Senile pneumonia of several types is common, and alas, is seldom diagnosed in the early stage! There is little pain, as a rule, but an oppressive feeling in the chest and dyspnea.

Treatment must be supportive, although cardiac stimulants should be used very conservatively. Synthetic depressants are rarely advisable. The same may be said of narcotics. When they are indicated Dover's powder or hyoscyamus commonly suffices.

Senile degeneration of the bladder gives rise to much discomfort, as do prostatic troubles. In women the troubles due to the menopause are played up beyond reason except when actual neuroses occur. These cases all require careful study, and there is, in the lack of such study, much useless and even harmful medication. Never forget that cancer or stone may be, at base, what needs most attention in some of these cases.

Chronic interstitial nephritis is very frequent in the aged and is usually associated with high blood-pressure and some edema. The nervous symptoms may be aggravated and cause much discomfort. Degenerated tissue cannot be restored and drug medication is only symptomatic.

Renal calculus causes a dull ache and sometimes shooting pain. Narcotics are rarely required except when the calculus is being extruded, causing renal colic, when the use of morphine is necessary. Vesical calculus causes a dull ache in the perineum. Hyoscyamus relieves the pain in most instances, with morphine indicated if the stone is passing through the urethra.

Active and passive hyperemia of the kidneys in the aged may be the result of the ingestion of irritating drugs, though disease of other organs may be responsible. Anuria, uremia, hematuria, nephritis and pyelitis are rather common, while a true cystitis is rather rare in the aged, despite its frequent diagnosis. It is not to the credit of many of us that we diagnose such ailments poorly and allow the case to become chronic, commonly under the name of chronic cystitis. Much drug addiction is thus induced.

Senile rheumatism is really an arthrosclerosis, and there is pain only on motion. Salicylates and counter-irritation are useless, medicines to overcome the senile debility being indicated. There is, of course, a true chronic rheumatism encountered in the aged, usually in persons who have worked hard in the cold and wet. In these cases there is a dull ache and more or less ankylosis. The patient does well in a dry and warm climate. Perhaps the iodides will benefit. I prescribe a combination of tincture iodine and Fowler's solution well diluted in water, but find baking and other physical measures more effective. It is common to prescribe narcotics for these people, and a greater mistake can hardly be made.

Now in the pain of arthritis deformans, which is commonly neuralgic and lessens as the disease develops until the patient is bed-fast through deformity, salicylates are often of great value, and in severe cases occasional use of opium is advantageous. There is, in these cases, a great liability to drug addiction, and the use of narcotics is justified only in emergency during the painful stage.

Gout is infrequent in the aged and colchicum is useful, but only in the acute attacks. Cocaine ointment relieves the

pain better than does morphine internally. Tincture of opium applied to the unbroken skin has very little analgesic effect; dilute alcohol does nearly as well.

Myalgia is frequent in the aged and often is very painful. Rest, heat, and sometimes galvanism are indicated. In pleurodynia strapping gives a measure of relief. Occasionally opium is needed.

In senile degeneration of the nerves and end-organs the patient complains sorely of pain if there is a lesion, even a scratch, which he can see or to which his attention is directed. Really there is little pain in such degenerations; but a senile pruritus may give rise to anything from mere discomfort to acute agony. Cocaine ointment is more valuable than is any medication internally.

The headaches caused by cerebral anemia, hyperemia, softening of the brain, or cerebral hemorrhage must be carefully differentiated or treatment may be very unwisely directed. Be very cautious about giving narcotics until after their need is apparent and the diagnosis is known definitely.

Senile neuritis is less painful than is neuritis in earlier life, but the pain is apt to be constant. Local analgesics are of great value and narcotics are rarely needed. Senile trifacial neuralgia produces lancinating pain at intervals, and sometimes morphine guarded with atropine is definitely indicated. Occipital or brachial neuralgia may also demand narcotics in treatment; but the indefinite and loosely diagnosed cases of so-called neuralgia in the aged are given vastly more narcotic medicine than is at all justified.

Paralysis agitans, bulbar paralyses, etc., require no narcotics. Some of the modified psychoses seen in aged persons may require the temporary administration of small doses of morphine.

Senile insomnia induced by anemia, neurasthenia, vasomotor changes, arteriosclerosis, etc., may demand hypnotics other than chloral; but it is seldom wise to give opium in chronic cases merely to induce sleep in the aged.

Spinal cord diseases are rather rare in the aged except in badly treated cases of syphilis resulting in tabes. In some hopeless cases one must reluctantly permit the patient to take morphine regularly.

Hemorrhoids are, usually, less painful when encountered in aged persons than when found in earlier life, but they are very apt to induce most aggravated pruritus, which is a serious factor in aged patients and must be relieved by local applications of cocaine or other local anesthetic.

Intestinal stenosis and biliary obstruction with jaundice occur frequently in persons of advanced age. The surgical factor involved should be very conservatively met, but there is little hope of real relief short of surgery.

Senile acute gastritis occasions much distress. The stomach must always be emptied and flatus disposed of. Narcotics do positive harm.

There is a true senile diarrhea which demands careful regulation of diet more than medication; and both the bacillary and amebic forms of dysentery occur, and they must be met in the same way as in younger persons. Simply calling them "chronic diarrhea" and restraining the evacuations by the use of opiates indicates that the sufferer has fallen into incompetent medical hands.

Gastric ulcer rarely begins after the sixtieth year, and when it does so occur the pain is usually slight, being expressed in the form of a rather persistent ache. When conditions are aggravated occasional use of morphine supported by atropine is justified.

An acute enteritis in the aged person is very painful, and for relief thereof opium is better than morphine. The chronic form of enteritis does not demand the use of narcotics.

Cirrhosis of the liver rarely occurs in very aged people, but passive hyperemia of the liver is common. Peritonitis is rather infrequent in the aged, but is nearly always fatal. Fortunately there is little pain, but, like acute pancreatitis, it kills.

As regards infectious diseases, the aged

person possesses a greater immunity to bacteria than do younger persons. Aged persons are apt to escape in epidemics except in some visitations of influenza, owing to chronic bronchitis affecting so many aged people. Cerebral and nervous symptoms are marked in aged persons having infectious diseases. Infectious pneumonia in aged people is, usually, rapidly fatal. Never give narcotics therein; the respiratory center is weakened at best, and narcotics may kill. Sepsis in the aged is very apt to be promptly fatal.

The primary syphilitic sore in the aged is apt to become gangrenous and give rise to much trouble. Never debilitate the parts by irritating applications and never apply phenol. The nervous symptoms of syphilis come on early in the disease and are very pronounced. Syphilis may be fatal within a few months in the aged. The gastric crises and lightning pains of tabes give rise to most intense suffering in aged persons. This should be relieved, so far as possible, with analgesics that are not too depressing; but there are aggravated and incurable cases in which morphine must be resorted to and perhaps continued until the end comes.

Neoplasms, cancer, and degenerative skin lesions are, alas, only too common in aged persons. These diseases constitute a great and unsolved problem. If conservative treatment fails, and even surgery when tried, resort may be had to various physical measures. The *x*-ray may at least relieve the pain. But we are all too frequently faced with the sole resort left, viz., the administration of narcotics. No one can criticize the physician who resorts to the use of narcotics to relieve the long-drawn-out suffering of the cancer victim.

Surgery in senility must be most conservative, and local anesthesia should be used where possible. Surgical shock is a serious matter in the aged, especially if the patient is diabetic. Morphine supported by atropine possesses a real value to prevent shock in all surgical cases, and it is especially necessary that such protection be given to the aged surgical case. Postoperative dangers are great in the aged, and there are many postoperative lesions that are constantly painful and require the use of narcotics.

Hygiene in the aged is neglected, and much pain and discomfort results in consequence. The aged need constant and sympathetic care and attention. Cleanliness is imperative, and it must often be firmly imposed upon the aged person, especially the aged man. Tactful and kindly handling will stimulate his pride. A modern bathroom is one of the best investments for the aged person, if possible for his own private use. Supply the aged person with good clothing and plenty of clean linen.

Give the aged person something to stimulate mental interest and arouse him. Maintain his pride and encourage mental activity. Take some magazines he likes, even if you do not care for them yourself. Shake him loose from pessimistic preachers and encourage him to go to a church where the pastor is a live wire; and also take him to the theater with you. One of the "girl shows" on the road advertises that it "puts pep in pop." Perhaps it does. Let him sit in the "bald-headed row" if he wants to; it will not hurt him.

Good food should be provided for the aged. Make for him special dishes he likes and that he can chew. Do not encourage the aged to eat much between meals, but if he retires late give him a light lunch at bedtime. Exercise in the sunshine, fresh air, good water, and plenty of sleep are good for the aged.

Take care of the aged person's feet and see that he has proper shoes. Let him have a stout cane; it will help to keep him erect and to walk with confidence. The hygiene of the teeth and mouth is important in the aged. Artificial teeth should be the best obtainable.

A little wine may be good for the aged, whatever it may be for others. Under prohibition, unless certain senile persons have a little wine prescribed for them, they may turn to something worse, viz., narcotics. Do not deny the aged man a reasonable amount of tobacco; it is a great

comfort to him and, if accustomed to its use, rarely hurts him appreciably.

Travel is good for the aged. Do not let the aged person think he is a burden to others. It is really wonderful how the matters of hygiene and personal care suggested serve to keep the aged person comfortable and even free from pain, imagined or real.

Finally, pain in the aged does not require the use of narcotics any more than it does in persons who are vastly younger. Certainly mere discomfort is no excuse for giving narcotics to any person, even the aged. Rational relief is what is needed for pain and discomfort, not constant drugging. And it is always well to remember that the aged person falls a ready victim to drug habits. All the physician needs to warn him against making drug addicts of the aged is to have some old person in his family who is enslaved to opium or morphine. Such persons not rarely are a great care and worry. Life is not sweet for them, and the presence of such a one in the household may annoy the whole family.

HORATIO C. WOOD, THE PIONEER IN AMERICAN PHARMACOLOGY.[1]

BY HOBART AMORY HARE, M.D.,
Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia.

My friend of many years, Dr. de Schweinitz, has spoken so well, in every sense of that word, of my old master, Dr. Wood, that there is little left for me to say that would give to the younger Fellows information concerning him or which can serve to recall to the older Fellows the characteristics of a very remarkable man. Possibly the best descriptive word for him is to say that he was a genius, because this term embodies brilliancy of intellect with qualities which are aberrant. There were occasions by no means infrequent when Dr. Wood would grasp the chief points of a subject or research with a quickness and accuracy almost uncanny, and there were other times, because his mental activities were engaged elsewhere, or dulled for the moment, when facts, seemingly quite obvious, would pass him by so that we would stand a little aghast at his conclusions or lack of appreciation of the opportunity. Sometimes after the glimpse at a great idea seemed to be a thing hopelessly lost, Dr. Wood would suddenly rouse himself, spring after the object which had left a trail, however faint, behind it, and, by no means rarely, would capture it, changing the onlooker from an observer filled with disappointment into one filled with admiration. These characteristics held true not only as to things which were scientific but as to affairs of life in general, and as he suffered with all his fellow mortals in errors of judgment, the result was that he was at the peak or in the abyss. Those of us who knew him well and were familiar with his moods were never sure in which place he would be, although the depths were never really very deep; they seemed so only by contrast with the peaks which he touched. He was a man utterly without guile, but of great mental and physical vigor, with a very kind heart, but capable when provoked of giving a youngster a severe reproof, not by a long harangue but with a well-directed dart. At times his frankness and guilelessness was like that of a child, but if, because of these qualities, any one tried to mislead him he soon found that he had met a fox.

He lacked diplomacy, and perhaps for this reason one always knew where he stood on a subject if you could get him to speak, and this did not require great effort. Without physical fear he nevertheless at times honestly belittled his own mental abilities. If the spirit moved him he could soar to heights of real eloquence and descriptive vigor. If it failed to move him he was lame and remained so unless perchance some one else said, or did, something which

[1]Read at a Memorial Meeting of the College of Physicians of Philadelphia, March 19, 1920.

aroused him, when he passed in an instant from a state of inertia into a charge so vigorous as to knock the pins from under the bystanders, and particularly from under the one who had intentionally or unintentionally aroused the sleeping lion. So too, if in full charge, an insidious or skilful side-thrust might hopelessly divert him. I well recall that at the First Congress of Physicians and Surgeons a debate on a neurological topic of some difficulty was arranged, with that brilliant neurologist of New York, the younger Seguin, as referee, and Dr. Wood as co-referee. Dr. Wood fully appreciated the skill and brilliancy of his antagonist, and repeatedly expressed the hope that when the hour of trial came he would be worthy of his adversary and go him one better, at the same time expressing the fear that he might go to pieces. We youngsters agreed that *one* of the disputants would be carried out, and while we were confident that our advocate was capable, we knew that if he suffered from one of his moments of humility our cause was lost. The fatal hour arrived, Dr. Wood began a little lamely, but, to use a horseman's phrase, soon got into his stride, and we were merry over his career, but suddenly while we gazed upon him his visage became blank and his tongue still, while his eyes seemed glued to an apparition. All eyes turned in the direction of his gaze. This apparition was the woman suffragist, Dr. Mary Walker, who was walking up an aisle leading to his very feet, clad in the trousers of a male, a frock coat, and with a silk hat in her hand. Like a demon of despair she seated herself in the front row not five feet from Dr. Wood, and the debate was virtually ended.

These somewhat personal recollections are perhaps justified in that they give an idea of Dr. Wood's personality, but I would be sadly lacking in my task if I did not emphasize one particular point in his career that marked him as a pioneer. Until the early seventies books which dealt with therapeutics were in reality volumes dealing with the Materia Medica, or at most a collection of reports upon the use of drugs on a purely empirical basis. The most notable of these works was, and is, without doubt that monumental evidence of literary research by Alfred Stillé, his book on "Therapeutics and Materia Medica," in two large volumes. No student of the present day can believe that his library is complete without this work, the more so as it contains a great deal of valuable information as to the toxicology of drugs. Dr. Wood recognized that there was an ever-increasing source of information as to the action of drugs in original researches carried out chiefly on the Continent of Europe. He clearly appreciated that the day for the purely empirical use of drugs was on the wane and that a new era was dawning in which the use of some of them at least would be based not only on bedside experience but upon experiments that would on the one hand explain their effects and on the other make their application more accurate. With this idea in view he compiled his well-known work on Therapeutics, which was the standard work in its many editions for several generations of students.

By its means he taught the profession that the haphazard use of drugs based on the results obtained in another patient was to be regarded with caution, and although conditions of disease in human beings always modify the results obtained in healthy animals he nevertheless emphasized this important fact, namely, that the physician must study the physiology and pathology of his patient and apply the known physiological action of a drug to meet the condition which needs correction. In other words, he was a pioneer in directing attention to the fact that accurate therapeutics requires a knowledge of physiology and pathology and demands a process of ratiocination on the part of the physician, rather than the habit of prescribing by rule of thumb because some one else has done the same thing. His conception of the action of digitalis, while not entirely in accord with our present views of the effects of this drug, nevertheless was remarkably in advance of his time in its accuracy, and it

is interesting to note that the very prevalent use of atropine at the present time to prevent collapse or combat shock had its birth in his teaching, although few persons seem to know this. Dr. Wood for some unexplained reason had, or pretended to have, little respect for surgeons as a class, although for individual surgeons like Agnew he had the greatest respect. He had a favorite saying that the difference between a physician and a surgeon was that the former worked with his brains and the latter with his hands, and he also held that as a class they were difficult to teach as to the use of remedies, a theory which perhaps holds true to-day. As an interesting illustration of this we find that he taught that shock was characterized by a great fall of blood-pressure and that atropine should be used to combat it, along with the use of heat properly applied, yet after he had taught this for years, Crile, as a surgeon, republished these facts, which were at once accepted, hook, bait, and line, by the surgical profession, who believed and seem to still believe that Crile was the originator of this doctrine. I do not mean to intimate that Crile's studies were not original in their character or not valuable, but he presented to surgery what Wood had taught for decades without attracting the attention the subject deserved.

In the early part of this memorial address I said that Wood was a genius with all the brilliancy and all the aberrance that that term implies. He made his mark because he had visions of a coming dawn in medicine as a science, because he had force and vigor, because he fought hard for the right whenever the opportunity arose. He was beloved by his students in his days of vigor because they were attracted by the vigor of his thought, by his eloquence, and by his realness. He could no more play double than can an innocent child, but he could fight for the right like a lion. Last of all he did something that it is given to few of us to do. He filled young men with enthusiasm for therapeutics as an art and as a science, and he taught them to think and by thinking to arrive at accurate deductions.

Finally, it may not be out of place for me, as one of his many pupils, to say that my master in therapeutics left with me cherished memories nebulous in the sense that they are not describable but nevertheless real. His kindly eye and his gentle smile balanced by vim and vigor have left us, but the memory of one who was a great teacher, an original investigator and pioneer in his chosen field, will linger long in the hearts of those who gained by his kindly ways, and who, if they are his true disciples, will always help younger men and endeavor to leave the world better than they found it.

THE ABUSE OF PASSIVE MOVEMENTS.

BRENTNALL, in the *Lancet* of January 24, 1920, states it is time that the phrase "massage and passive movements," as loosely indicating a form of treatment on to which responsibility for future failure may be thrown, should disappear for ever. While of value in a few cases, not only is it useless as a routine therapeutic measure, but in many cases it does definite and positive harm. It is for these reasons that machinery of the Zander type has been excluded from up-to-date physiotherapeutic departments. Voluntary movement, on the other hand, whether reënforced externally or not, undertaken at the right moment, is a valuable method of treatment, physiologically correct, carrying with it its own guarantee of safety.

It is considerations such as these that emphasize the necessity of a single control —that of the surgeon—over the treatment of a patient, no matter whether in the outpatient department, the ward, the massage and electrical department, or the gymnasium. The surgeon responsible for the ultimate restoration of the patient to his maximum degree of capacity should be responsible also for the treatment the patient receives in the various departments of the hospital. There is no doubt that the system of "water-tight" departments of treatment with separate heads is to be held to blame for a certain degree of permanent disability following injuries.

EDITORIAL.

SHOCK, CHOLERA, COLLOIDS AND CRYSTALLOIDS.

We think it may be truthfully stated that the results obtained by surgeons and physicians who inject normal saline into the veins in cases of shock have been woefully disappointing. Not only have the injections failed in civil practice, but it is evident from the results obtained in the great war that this use of normal saline, while possibly presenting some advantages, falls far short of meeting the emergency, and this holds true whether a normal saline be employed or a hypertonic solution of salt is used. Chiefly because it was thought that the saline solution left the blood-vessels and passed from the tissues through the kidneys or out by the bowels so promptly as to be useless in maintaining circulation, Bayliss, and others who followed him, as our readers know, combined gum arabic with normal saline, thinking that by the use of this substance the saline solution would be retained in the blood-vessels and so sustain a circulation which was essential to the maintenance of vital function at the base of the brain. While Bayliss' methods were followed with enthusiasm, nevertheless it would appear that the employment of this colloid substance has not proved in practice what was indicated in theory, and it is evident that even if the gum arabic is an efficient agent in preventing the loss of salt solution its injection only meets one of the conditions which is present in shock, which is a state undoubtedly consisting of not one disturbance of function but of many.

On the other hand we think it will be admitted that the intravenous injection of normal salt solution in cases of hemorrhage is productive of very much better results than it is in shock, and this method can be wisely employed when it is impossible to obtain a blood, for direct or indirect transfusion, which is compatible with the blood of the patient. That there should be this difference in the action of salt solution in shock and hemorrhage is not surprising, since in shock the man has been bled into his own blood-vessels, those of the abdomen being greatly engorged, whereas in hemorrhage there has been an absolute loss of blood.

A highly scientific discussion of the reasons why salt solution, with or without gum arabic, succeeds in one case and fails in another was contributed to the *British Medical Journal* of October 18, 1919, by Moore of the Department of Applied Physiology of the British Medical Research Committee. He points out at the beginning of his paper that Rogers has found in India that Bayliss' solution is of no avail to combat the loss of fluids and toxemia in cholera, whereas hypertonic solutions without gum arabic are exceedingly efficacious; but as Moore states, the conditions in these instances are widely separated, and he tries to explain why Bayliss' solution may be useful in hemorrhage and useless where the tissues are drained of fluid and toxic.

Moore believes that the common cause in all these states is a disturbance of that delicate equilibrium between the colloids of the blood and of the cells (such as proteins and lipoids) and the crystalloids (such as sodium chloride) existing united or absorbed in common solution or suspension. He points out that in shock due to surgical injury, or prolonged anesthesia, the condition is one in which the circulating fluid is not merely defective in total volume but also relatively poor in colloids as compared to crystalloids. The result is that inorganic salts or salines, generally given alone, are rapidly eliminated, having no colloid to anchor them, and so being treated as foreign bodies and thrown out by the kidneys and intestine, whereas gum arabic, gelatin, and plasma proteins cannot be so expelled and serve to anchor inorganic salts and so preserve the equilibrium of crystalloids and colloids not only in the blood but in the master cells of the brain and heart.

There is not space for us to quote the

scientific points which Moore adduces in regard to the variations in osmotic pressure arising from changes in the quantity of colloids and crystalloids. The point that Moore wishes to emphasize is that when a solution of gum arabic is injected intravenously it will at once seize upon and hold a certain amount of saline in the blood, and as a result of its presence the total salt content with which nerve and muscle cells stand in common equilibrium will rise. When hypertonic salines are used in cholera the proposition is quite different. Here there is an excess of toxic colloids and a deficiency of balancing salines. In other words, as Moore puts it, the upset is in the opposite direction. More electrolytes or salines are needed to combine with circulating toxic colloids, and when gum arabic solution is used it prevents the toxic colloids from combining with the salts and thereby being prepared for elimination from the body, for the unattached colloidal toxin molecule possesses no osmotic pressure. In other words, nothing to drive it through an excreting cell. When, however, it becomes attached to a crystalloid this takes place, and, to use a clever illustration employed by Moore, the unattached toxin is like a drifting hulk or barge with no motive force of its own, while the crystalloid from the hypertonic solution is like a tug to this barge, towing the toxic colloid out through the intestinal mucosa or the kidney. Further, Moore believes that the tug once attached to a barge cannot readily break its towing rope and go through the secreting cells alone.

When gum acacia is used in shock the colloidal molecule is too large to pass out, and this retains the crystalloid, the two together producing an osmotic pressure which maintains the volume of the blood.

It will be seen at once that the theory of Moore depends upon whether he can show that the osmotic pressure of the colloidal toxin united with saline is different from that of the colloid represented by gum arabic. He claims that the molecule of toxin in cholera is smaller, and to use his words the saline tug carries it through the intestinal and kidney cells and rids the body of the poison.

Concerning the value of hypertonic solutions in anaphylactic shock, he expresses the view that the lecithins of the nerve cells and muscle cells have been rendered sensitive to the particular serum by reaction with the first dose of serum injected, and that these cells *in situ* within the animal's body are in precisely the same position as the colloids of the serum such as we have already described.

Finally, Moore calls attention to a point which we have frequently emphasized in these columns, namely, the wonderful insistence on the part of the body that the salinity of the blood and tissues shall not vary from 0.7 in some animals to 0.9 in man, and he points out that this holds true not only of warm-blooded animals but of cold-blooded animals as well, so that often those which exist normally in sea-water are able to always maintain their balance between crystalloids and colloids, and without this balance life, as Moore points out, as it now exists, would be impossible.

THE LEUCOCYTE COUNT IN TONSILLAR INFECTION.

The fact that a high leucocyte count, the chief increase being in the polymorphonuclear cells, is indicative of an inflammatory process is often used as an additional factor in reaching a diagnosis in otherwise obscure cases, but it is important to remember that certain chronic conditions may maintain a constant leucocytosis and that this in the presence of some new condition may mislead the physician. As might be expected an acute tonsillitis or a true quinsy produces a high leucocyte count, and the very existence of such condition would prevent the physician from attaching too much importance to a high leucocyte count if appendicitis or pneumonia were thought also to be present.

In a paper published in the *Journal-Lancet* by Walsh, a report is made of a group of cases, ranging in age from eight

to twenty-nine years, in which he shows that chronic tonsillar trouble often results in a high leucocyte count even when the disease is so slight as not to be easily discovered, or, in other words, he shows that tonsils which are small and deeply buried, but nevertheless infected, may produce such a condition. He found that the leucocyte count under these circumstances varied from 15,000 to 20,000, and that this leucocytosis disappeared within three months after the tonsils were removed. These results would indicate that before too much reliance is placed upon a high leucocyte count in the diagnosis of an obscure case, all other causes of such a change in the blood picture should be eliminated before the great increase in white cells leads the physician to place this manifestation in the list of points which lead him to believe that some acute infectious process is present and is the cause of acute illness.

Every one has recognized for many years that a high leucocyte count is of value only when taken in connection with other symptoms, but this paper of Walsh indicates that very low-grade inflammatory processes, long inactive, and with no symptoms to direct attention to the tonsils, may nevertheless produce a high blood count and so mislead us in the study of a case.

THE USE OF TUBERCULIN IN PREVENTING THE SPREAD OF TUBERCULOSIS.

A few years ago the use of tuberculin as a diagnostic and therapeutic agent was resorted to far too frequently by general practitioners and it did much harm. We have repeatedly pointed out that it should never be used as a therapeutic agent except when a patient is in a hospital, or sanitarium, and under constant observation, and that the practitioner who employs it should be one who has had large experience in the study of tuberculosis and in the practical use of tuberculin. We believe that its employment otherwise is to be condemned.

So, too, we have long felt that its employment as a diagnostic agent was, as some one has cleverly expressed it, "like looking for a gas leak with a lighted candle." The patient who has sufficient evidence of tuberculosis to lead the physician to the use of tuberculin as a diagnostic agent may be said to already present sufficient symptoms to justify being treated for this disease without the danger of flaring up a low-lying process.

This editorial note, however, is not intended to deal chiefly with this aspect of the tuberculin problem. Its employment by veterinarians as a means of reaching a diagnosis in domestic animals of tuberculosis for the protection of foodstuffs has proved a veritable godsend not only in preventing the dissemination of animal tuberculosis to human beings, but to stock raisers as well, for although on occasions its use, with positive results, causes the owner financial loss when his cattle are destroyed, in the long run eradication of tuberculosis from a herd is a money-saving proposition for the whole industry. It has been found that within short periods of time the slaughter of cattle, found to be tuberculous by means of this test, has eradicated the disease from herds of large size, so that all of the cattle were found to be absolutely non-tuberculous.

Emphasis has recently been laid upon this important subject by Farmer's Bulletin No. 1069 issued by the United States Department of Agriculture, which is copiously illustrated and which should be in the hands of every stock raiser, as doubtless the government wishes it to be. In many instances these Bulletins count for little with the general reader, being of such a scientific nature that the ordinary layman cannot get much out of them, but this is not the case in this instance, and we hope this Bulletin 1069 will do an immense amount of good.

In this connection it is of interest to note that some years ago the mortality from tuberculosis among the monkeys in the Philadelphia Zoological Garden was so great as to produce a grave question as to

whether the monkey-house could be continued. Upon the application of the tuberculin test it was found that many monkeys were infected. These were destroyed, and all new monkeys were tested before they were introduced into the cages, with the result that the mortality in the monkey-house from tuberculosis has become practically *nil,* thereby preventing much suffering to the animals, and a great expense to the Zoological Gardens has been prevented.

ALIMENTARY TOXEMIA.

Under this and similar headings there has accumulated an enormous literature contributed both by the surgeons and the medical men, each agreeing that practically all the ills to which the human is subject are in many, if not in most, cases attributable to absorption of toxins from the alimentary tract. This absorption is due to a slowing of the downward passage of the intestinal contents. This intestinal stasis has been held responsible for practically every ailment recognized as an entity, from arteriosclerosis to wens; and even in the case of acute and chronic infections of known bacterial origin it is held that stasis is the predisposing factor. The extremists of this cult have had to contend with the men of a newer school, who hold that the first and last chapters of human pathology, and the rest of the book, should contain a brief preface which refers, from the etiological standpoint, all human ills to the teeth. There are few practitioners who believe that there are other factors, both underlying and exciting, than either the teeth or the bowels operative in causing disease conditions. The whole profession recognizes the important bearing which intestinal absorption of waste material slowed in its passage may have upon existing disease, and believes that the absorption incident to this slowing may at times be the cause of progressive and ultimately fatal lesions.

Lane has attacked the problem of intestinal toxemia boldly, adopting the simple expedient of short-circuiting, which is not without its risks and not infallible in its results. Metchnikoff was more successful in so far as human life and happiness are concerned in his method, which from the patient's standpoint was more satisfactory. The method was based on the free use of sour milk.

Chetham-Strode and Benjafield (*The Lancet,* Jan. 10, 1920) note that lactic acid fermentation of the large intestine is the condition to be aimed at, and that therefore the problem reduces itself to one of simple chemistry. Lactic acid is produced in milk by the fermentation of the lactose by bacteria. We have in the large intestine numerous bacteria capable of effecting this. We have, therefore, to find some means of supplying the necessary lactose. Carbohydrates administered by the mouth in the usual easily digestible form will not supply this ingredient, as they are broken up and absorbed during their passage through the stomach and small intestine. Thus the carbohydrate must be supplied in some form in which it can resist the action in part, at least, of the gastrointestinal ferments.

The simplest means of overcoming this difficulty, and the one adopted by the writers in their practice, is to administer the carbohydrates in the form of coarse uncrushed oatmeal. This may be taken raw or cooked sufficiently to soften the outside of the grain only, leaving behind a hard core. The result is that the partially digested grain reaches the large intestine in the form of carbohydrate. The center of the grain is composed of unaltered starch, whilst the outer layers, which have been subjected to the digestive action of the juices of the mouth, stomach, and small intestine, are composed of simpler molecules, the disaccharins and hexoses. Both these latter can be rapidly converted into lactic acid and CO_2 by a suitable bacterial flora.

The feces of the average individual are neutral or alkaline to litmus, and from

what the authors have already said it would appear that the production of a lactic-acid fermentation is quite a simple matter. This takes place in many cases, more especially when dealing with the young, but there remain quite a large number of individuals whose excreta do not at all readily become acid.

The causes which may prevent the acid fermentation may be grouped under the following headings: (1) Stasis; (2) presence of unsuitable organisms in the fecal flora; (3) absence of essential organisms from the fecal flora; (4) an unsuitable dietary.

On examining Gram-stained films of the feces of individuals who are more or less constipated one finds the following bacterial elements: (*a*) Gram-negative bacilli of coliform group; (*b*) Gram-positive cocci and diplococci and short chains of streptococci; (*c*) Gram-positive and Gram-negative bacilli containing spores; (*d*) Gram-positive coarse bacilli without spores (Bulgarian group). In a case in which stasis is marked those classified under (*a*), (*b*), and (*c*) will all be present in fecal films in large numbers, whilst (*d*) will only be found after some search. On the other hand, films from a case in which stasis is absent will show a very different picture—that is, complete absence of spore-bearing bacilli, very few streptococci, a large number of bacilli of the Bulgarian group, and the remainder coliform organisms. Another difference between the two microscopic preparations will be seen; in the first the definition of the organisms will be poor and the stain taken up irregularly, whilst in the second specimen the converse will be the case. However, the most marked difference between the two specimens is to be found in the relative proportion of the Bulgarian to the coliform organisms. In the first case they may be in the proportion of 1-250 coli, whilst in the second case they may constitute a much higher ratio—*e.g.*, 1-5. Thus this ratio, which one may legitimately term the "Bulgar index," can be accepted as an indication of the presence or otherwise of intestinal stasis.

In some cases when the coarse, partly cooked oatmeal does not produce an acid reaction, deep abdominal massage may be efficient. Aperients may be required. Aloin is generally most useful. Calomel may be used occasionally, but should not be given too frequently as it appears impossible to maintain a lactic fermentation if any mercury is being administered. Liquid paraffin is also contraindicated, as it again prevents this fermentation from taking place, possibly by forming a film-coating over the oat grains, and so preventing their interaction with the necessary bacteria.

In long-standing cases of stasis matters may be somewhat accelerated by washing out the large intestine at the commencement of treatment. The possibility of stasis must not be overlooked in a patient who gives a negative history as regards constipation, for on examination these may prove to be well-marked cases in which the daily action is to be regarded merely as being an overflow from an already full cesspool.

Should a case resist the above measures, it will next be necessary to plate out the feces on some differentiating medium. MacConkey's neutral red-bile salt-peptone-lactose-agar the authors have found to be the most generally used for this purpose. A thorough search for any non-lactose fermenters should be made, and in an obstinate case the examination should be repeated on several occasions before definitely excluding their presence. Should any non-lactose fermenters of the coliform group be present, a vaccine of this organism should be administered, for from experience it appears that the presence of a very small proportion of organisms of this class is fatal to the production of the desired fermentation. Usually after a few doses of an autogenous vaccine the invader disappears and the patient's stools become acid.

A sure guide of the patient's progress may be obtained from the "Bulgar index." Also much valuable time may be saved by the discovery at any early stage of a non-lactose fermenter.

A class of case may be recognized by the failure to produce acid fermentation, in spite of the fact that severe stasis has already been relieved, and by the failure to isolate non-lactose fermenters from the stool. In such instances the fecal films do not show a good "Bulgar index," but the proportion of the Bulgar group to the coliform organisms remains about 1-40. These require a sour-milk preparation which is rich in the required organisms.

After all the measures already detailed have been tried there will still remain a small residue of cases in which one cannot produce an acid fermentation and which are not materially benefited by the treatment. For this reason it is obvious that the possible criticism that the beneficial results of the treatment are due merely to the amount of purging the patient is subjected to, cannot stand. The presence of the lactic-acid fermentation appears to be an essential one, and once this is obtained the rapid results achieved are almost incredible. Possibly the explanation is merely one of improved drainage—that is, the large intestine becomes much less tolerant to an acid content and therefore is in a constant state of peristalsis.

The teaching outlined would lead one to infer that in many cases of intestinal stasis a brief bacterial study of the stools and a proper establishment of the "Bulgar index" should bring about a prompt cure, nor theoretically do the methods of obtaining this "Bulgar index" seem singularly difficult. As a matter of fact intestinal stasis usually depends upon mechanical or at least a reflex process. Often this process is a chronically inflamed appendix which gives no other symptom. At times it is incident to more general and systemic causes. In any event the first effort at cure should be in the direction of removing, if this be practicable, pathological conditions which may be the cause of spasm and delay the passage of intestinal content. Lane's concept of exclusion and colonic removal comparatively few surgeons are in sympathy with, excepting for the advanced case in which the colon has ceased to be a propelling agency of value and has been converted into a pathological and foul reservoir.

RADIUM THERAPY.

It cannot be denied that radium has both curtailed the number of surgical operations, and increased the scope of surgery; this particularly in regard to malignant infiltrations.

In skin lesions, both of the malignant and non-malignant type, its beneficial effects have been convincing; moreover the absence of scarring offers a conspicuous advantage over the employment of other agencies which have often been equally efficacious in accomplishing a cure. The uterine fibroma in its earliest development has been treated by radium and has given an astonishingly large percentage of cures. There is reason to believe, although this has not been proven, that a radium treatment following operation may by its inhibiting effects on cancer cells markedly lessen the tendency to recurrence. There is still further reason to believe by the combined use of radium and the knife operations for returning malignancy, which have heretofore been regarded as hopeless, may be attempted and carried out, with a percentage of ultimate successes which gives them their complete justification.

In the report of the work carried out at the Radium Institute of London in the year 1919, quoted in the *American Journal of Surgery* for December, 1919, the conditions in which radium has proven curative are warts, papillomata and granulomata, leukoplakia, many kinds of skin diseases, keloids and vicious cicatrices, cavernous nevi (not port-wine stains), tuberculous adenitis, tuberculosis of the skin, fibroid disease of the uterus, chronc metritis, and arthritis deformans.

The increasing number of cures, and some of them lasting for years, of proven malignant growths, suggests that with a better technique even these conditions may respond not occasionally but habitually to the use of radium. The jury which

ultimately determines the value of any treatment is the profession at large, and the increasing demand for radium based on carefully observed and in many cases honestly reported results is in itself a sufficient proof of the value of this agent.

Kelly calls attention to the skepticism with which his first publications were received, and holds the profession is still lax in not referring cases of Hodgkin's disease, and of leukemias, and of the various blood dyscrasias associated with enlarged spleen, for prompt massive radiations in the early stages.

He says that pure metallic radium has never been seen in this country, one of its bulkier salts or its gaseous emanation being the form always used. He cautions buyers to verify purchases by the United States Bureaus of Standards. He notes that all the active material of a whole gramme of radium in the form of a salt can be accumulated in a tiny, intensely active glass button not as large as the head of a common pin.

The difference between using the radium salt itself and using the emanation, its active secretion, is much like the delivery of cow's milk. In old times the cow was often taken from door to door and milked at each stand; in modern times the milking is done out in the country, where the cows are kept in a barn; and the milk only is brought to town. The radium is the cow, and the emanation is the milk.

Moreover, the emanation can be planted in the tissues permanently in minute capillary glass tubes, each containing from two to three or five millicuries of the gas. It is noted that in lymphosarcoma the radium often acts like magic, the effect being extraordinarily rapid. The futility of surgery in these cases is well known. Cancer of the thyroid has apparently been cured by it. As for sarcoma and carcinoma of the breast, this as in the case of other carcinomata must be handled with sledge-hammer blows. Without operation it is impossible to know just how many foci of the disease are distributed. Therefore the principle of repeated treatment of each affected spot is not possible. Early cases of cancer of the breast are best treated by operation; on the other hand, utterly inoperable cases often improve remarkably under treatment. Radium treatment, however, does not take care of metastases.

As for cancer of the neck of the uterus in early and very favorable operative cases, operation, preceded by thorough radiation, offers the best chance. When the patient is under the constant supervision of a skilled radium therapist it is probable that radium alone will do more than an operation without the risk or mutilation. Indeed the prediction is made that within five years operations will be no longer performed. A fruitful field for radium therapy lies in the recurrent cancers of the vaginal vault. When these are seen early they can often be wiped out, never to recur.

In "idiopathic," or so-called myopathic, bleeding uteri—that is to say, in all persistent uterine bleeding without gross demonstrable cause, about the time of the menopause—radium is the one supreme remedy.

Kelly closes his article by stating that two things are of vital importance: first, that the earlier the case is seen the better are the chances of a permanent result; secondly, that every case ought to be followed up carefully at intervals of a few weeks or months, for years.

REPORTS ON THERAPEUTIC PROGRESS.

TREATMENT OF EMPYEMA.

In the *Journal of the American Medical Association* of December 20, 1919, HARLOE states, after a roentgenogram of the patient has been taken to determine the location of the pus in the thoracic cavity, the skin over the affected side of the thorax is to be prepared with 3.5 per cent tincture of iodine. After two or three minutes the iodine is washed off with 95-per-cent alcohol and the area for the insertion of the trocar is anesthetized with 0.5-per-cent solution of procaine. The area usually selected is the seventh or eighth interspace in the midaxillary line. The presence of pus and the thickness of the thoracic wall is now determined by means of a 30-Cc. Luer syringe and aspirating needle, after which a small incision is made through the skin at this point to permit ready passage of the trocar and cannula. The trocar and cannula are inserted slowly to the previously measured distance; then the trocar is withdrawn and the thumb of the left hand is placed quickly over the cannula to prevent the outflow of pus or inrush of air.

We are then ready for the passage of the rubber tube through the cannula into the pleural cavity. A stiff-walled rubber tube about 14 inches in length and conforming in outside diameter to a No. 18 French catheter is selected. Three small side openings are cut about three-sixteenths inch from the end. This is called the inner end of the tube, and it is the one which is placed inside the thorax. To insert the tube, the outer end is closed with an artery clamp, and the inner end placed in position so that, as the thumb over the cannula is removed, the tube may be passed quickly into the thorax. A distance of five inches is sufficient. The cannula is slowly removed, and when just free of the skin a clamp is applied behind it, the outer clamp removed, and the cannula slid off. A 30-Cc. Luer syringe is then attached to the tube, and a small quantity of pus (about 60 Cc.) is aspirated to insure absence of kinks.

After the tube has been properly placed, it is necessary to maintain it in its position and also to prevent the passage of air into the thorax between the tube and tissues. To accomplish this, a specially designed rubber cap is fastened to the skin by means of Sinclair's glue. After the cement has been applied to the skin and under surface of the rubber cap, the thoracic tube is pulled through the cylinder of the support by means of a clamp and the whole pressed tightly to the body.

When the cap is stuck firmly, it is further supported in place by three 2-inch straps of adhesive plaster pressed tightly against it and passed around the chest. A bandage covering the adhesive plaster will prevent its edges and corners from rolling up. The patient is then ready for aspiration of the pus.

A small box hanging from the middle cross-bar at the head of the bed contains a 5-liter bottle fitted with a two-hole rubber stopper through which pass two snugly fitting glass tubes bent at right angles. The tubes pass into the bottle just as far as the shoulder, one being an inch shorter than the other. The short tube is connected with a 3-inch piece of thick-walled rubber tubing containing a hard-rubber stop-cock, which in turn is connected with the tube from an electric vacuum pump. The longer glass tube is connected with about 3 feet of the same rubber tubing, which runs alongside the pillow and is joined through a hard-rubber stop-cock to a hard-rubber Y tube, the stem of which connects with the tube leading from the patient's chest. The third arm of the Y tube connects with a third similar stop-cock and a piece of rubber tubing running to a bottle of Dakin's solution on a board above the patient's head.

A gauge, graduated in millimeters of mercury, is attached to the pump. If the

pump is started at about 40 mm. negative pressure, and the stop-cocks are turned in the proper direction, the pus will begin to flow freely into the bottle. When the pus ceases flowing, the stop-cock in the tube leading to the bottle containing the pus is closed, while the stop-cock in the tube from the Dakin bottle is opened and about 50 Cc. of Dakin's solution are permitted to run into the pleural cavity. This stop-cock is then closed, the one leading to the bottle is opened, and the Dakin's solution passes from the pleural cavity into the bottle. This aspiration and irrigation is continued until the returning fluid from the pleural cavity is clear. The procedure is repeated every two hours during the day, and every four hours during the night. After a few days, when the flow of pus has nearly ceased, the Dakin's irrigations are given only at 8 A.M., 2 P.M., and 8 P.M. At each of these periods 15 Cc. of glycerin, containing 2-per-cent formaldehyde (children, 10 Cc.), are injected and all stop-cocks closed and kept closed until the time arrives for the next irrigation.

When patients are able to be up and about, the chest tube may be clamped and disconnected, and the clamp pinned to the dressing so that it will not drag on the tube.

The dressings should be reapplied at least once in two weeks or oftener if they show any signs of leaking. Care should be taken that the chest tube is not removed and that it is safely clamped.

Since January, 1919, fourteen cases have been treated by this method. Two children are still under treatment.

In his comment Harloe says it would have been gratifying if he had been able to carry out this method of treatment on a larger number of patients before reporting the results obtained, but the ease with which the operation is borne and the absence of all discomfort following the application of this method prompt him to report it at this time. Among other advantages of this method he adds: "There is no collapse of the lungs, and, therefore, no loss of function. This is of great importance, especially in an associated pneumonia of the opposite side. There is no deformity of the chest or spinal curvature as generally follows a radical rib resection. There are no wet dressings to be changed, as all pus and washings are out of sight in the bottle behind the head of the bed. Most of all, there can be no pocketing with the lungs drawn down, filling the chest cavity; if we have no pocketing, it is safe to assume that we shall have less, if not entire absence of, chronic empyema. Besides this, we obtain chemical sterilization of the pleural cavity under a constantly maintained negative pressure."

ARSPHENAMINE VS. NEOARSPHENAMINE.

In the *Journal of the American Medical Association* of December 20, 1919, SCHAMBERG states that studies of the comparative toxicity of arsphenamine and neoarsphenamine are most interesting. In general terms, neoarsphenamine is over two and one-half times less toxic for white rats, by intravenous injection, than the arsphenamine from which it is made. A lot of arsphenamine which is tolerated by rats in the dose of 100 mg. per kilogramme of body weight, when converted into the "neo" compound, will be tolerated in from 250 to 300 mg.

The addition of the "formaldehyde sulphoxylate group" apparently lessens the affinity of the compound for the protoplasm of the parasite, but seems to lessen the affinity for the body proteins still more. The lessened affinity is due to the closing of one of the "amino" groups.

We should expect from the foregoing observations that neoarsphenamine would be subjectively better tolerated than arsphenamine, and this, as a matter of fact, is the general experience. It must be realized that neoarsphenamine is much more unstable and therefore undergoes change in the powder form much more readily than arsphenamine.

It should never be administered if the solution is not brilliantly clear, for a cloudy solution will produce immediate reactions with syncope (in rare cases fatal) as the

dominant symptom. If filtering does not completely clarify the solution, it should be discarded.

Despite such reactions, the cloudy solution does not show increased toxicity in animals. The action appears to be mechanical.

Neoarsphenamine is less active therapeutically than arsphenamine, but the difference in this respect appears to be largely made up by the discrepancy in the tolerated dose. He has found it possible to give neoarsphenamine in full doses at frequent intervals without reaction. He commonly administers in appropriate cases 0.9 gm. three times a week in early cases of syphilis. Neoarsphenamine appears to create less commotion in the blood and tissues than arsphenamine.

Which compound will ultimately be accorded preference cannot be forecast. He does not know of any rigid and extended comparative test of the two compounds on a large series of patients with careful data on the serologic end-results. Such an investigation is now being carried out.

THE PREVENTION OF SIMPLE GOITRE IN MAN.

KIMBALL, ROGOFF, and MARINE in the *Journal of the American Medical Association* of December 20, 1919, state that the following report is based on the reëxamination of the girls in the public schools of Akron, Ohio, in grades from the fifth to the twelfth, inclusive, made from November 26 to December 3, 1918, nineteen months after beginning the prophylactic use of iodine. The first report—a survey of the incidence of thyroid enlargements (goitre)—was based on the examination made in April, 1917. The second report gave the results of the examination in November, 1917—seven months after beginning the prophylactic use of iodine.

The same classification of the condition of the thyroid has been used as in previous examinations, namely: normal, slight, moderate, and marked enlargements, adenomas, and persistent thyroglossal tracts. The pupils were further examined for gross manifestations of exophthalmic goitre and myxedema. No obvious case of either of these diseases was detected.

The same method as outlined in the first paper and modified in the second paper was used—*i.e.*, 2 gm. of sodium iodide were given in 0.2-gm. doses on ten consecutive school days, repeated each autumn and spring. The results are given in Tables 2 and 3. For reference and comparison, the figures for the November, 1917, examination are added.

The most striking fact brought out is that not a pupil in whom the thyroid was normal at the November, 1917, examination, and who took iodine, showed any thyroid enlargement; while of those not taking iodine, 15.9 per cent showed definite enlargement. This effect is similar to that noted in last year's examination. As was seen last year, a distinct therapeutic effect is again observed in that the glands of 38.1 per cent of the pupils with slightly enlarged glands decreased following the use of iodine, while of the glands of those listed as not taking iodine 27.8 per cent showed a decrease in size. This difference is much less than that found last year and suggests that many pupils with slight goitre were taking iodine privately. The same therapeutic effect is also noted in those with moderate and marked enlargements, and again the percentage differences between those taking and those listed as not taking iodine is less than last year's figures.

The main effects of the administration of iodine observed during the second year are similar to those noted during the first year. The danger of iodism or of exophthalmic goitre from the use of such amounts of iodine as were given is shown to be negligible.

They summarize their article as follows:

1. Simple goitre in man may be prevented on a large scale.

2. The method used is practical and economical, and can be recommended as a public health measure in goitre districts.

3. Two gm. of sodium iodide given twice yearly, as indicated, seems adequate.

DEXTROSE TOLERANCE IN ATROPHIC INFANTS.

MATTILL, MAYER and SAUER in the *American Journal of Diseases of Children* for January, 1920, summarize their communication as follows:

1. The glucose tolerance of the approximately normal infant, as determined by the Woodyatt method, is very likely identical with that of the normal adult, which is 0.8 to 0.9 gm. per kilogramme per hour.

2. The tolerance of atrophic infants for glucose is considerably greater: it varied in their cases from 1.4 or 1.5 gm. to 1.8 gm. per kilogramme per hour.

A STUDY OF PNEUMOCOCCUS CARRIERS.

SAILER, HALL, WILSON, and MCCOY, in the *Archives of Internal Medicine* for December, 1919, state that their results of the disinfection experiments may be summarized as follows:

1. Dichloramine-T, 2 per cent, dissolved in eucalyptol gave good results. Used in solution in chlorcosane the results were far less satisfactory.

2. Chlorine gas is not efficient and caused discomfort, and is possibly dangerous even in such concentration as was used.

3. Phenol, 3 per cent, shows good results. The solution in oil is more efficacious than that in glycerin. The use of instillations rather than sprays is perhaps preferable on account of reduced danger of ear infection.

4. Iodine, 5 per cent, in oil gave good results. It is usually available and caused no discomfort. Two drops in each nostril and throat swabbed.

5. Quinine sulphate, 2 per cent, proved of no value against the pneumococcus. An accidental observation suggests that it may be valuable in another way. The experiment was under way when the spring epidemic of influenza visited the camp. The carriers of other groups were attacked by the disease in the same proportion as the men of the rest of the camp. No cases of the disease developed in the group being sprayed with the quinine. The prompt subsidence of the epidemic prevented further observations.

6. Chloramine-T is apparently of little value.

While many factors beyond their control have combined to make much of their work unsatisfactory, they feel that they are justified in advancing the following conclusions and suggestions at least tentatively:

The oily solutions of phenol and of iodine have proven most valuable in their hands for this purpose. They are usually available and easily and safely applied by untrained men.

They believe that the contacts of cases of pneumonia should be subjected to culture in the same way as is now done for contacts of meningitis. That when such contacts are shown to be carriers of the same type of pneumococcus as that infecting the patient, vigorous antiseptic treatment should be instituted, combined with such measure of isolation as conditions permit.

They advance the opinion that in the presence of epidemics of pneumonia or of diseases fatally complicated thereby, such as influenza or measles, it is practical to treat large numbers of men by these methods, and that such treatment should result favorably.

ACETYLSALICYLIC ACID AND HEAT REGULATION IN FEVER CASES.

BARBOUR, in the *Archives of Internal Medicine* for December, 1919, concludes a contribution as follows:

1. Acetylsalicylic acid, in 1-gramme doses, which have no such action in normal persons, exhibits a marked antipyretic effect in febrile, temporarily afebrile, and convalescent subjects.

2. In one and one-half hours the temperature change averaged —0.81° C. on four control days.

3. In the control experiments the heat elimination averaged 37.7 calories per square meter per hour. Under acetylsalicylic acid it became 52.1 calories, an

increase of 38.2 per cent. The antipyretic effect is due essentially to this change, which is associated with marked perspiration and subjective warmth.

4. The fall in temperature was accompanied by a heat production of 38.8 calories per square meter per hour, a decrease of 3.5 per cent below the 40.2 calories of the control days. This change is probably merely the result of the cooling of the body.

5. The drug caused an average decrease in the pulse-rate of ten beats per minute. Temporary cardiac disturbances were noted in two cases.

6. The return to the initial temperature level is brought about essentially by a reduction of the heat elimination to about one-half of the normal figure, and is unaccompanied by shivering or marked increase in carbon dioxide output.

7. Sensitivity of febrile, temporarily afebrile, and convalescent subjects to antipyretics is not yet explained. These drugs do not "stimulate" a "depressed" heat-regulating mechanism, nor is sensitivity due to a lack of readily combustible material (dextrose); but the respiratory quotient of antipyretic sensitive individuals appears to be increased by doses of acetylsalicylic acid which do not affect the quotient of normal persons. Further studies of the carbohydrate metabolism may elucidate the question of sensitivity.

ALLEVIATION OF DISTRESSING DIGESTIVE SYMPTOMS IN CARDIO-RENAL DISEASE.

NILES, in the *Journal of the American Medical Association* of December 27, 1919, states that as a cardiac "steadier" plus a diuretic, he has much confidence in the infusion of digitalis—more perhaps than in any other preparation of this drug. However, the infusion must be fresh and must be made from fresh and dependable digitalis leaves, otherwise the results will be disappointing. It is his custom to give one-half ounce, four times the first day, especially if the pulse is accelerated. After that he has found two teaspoonful doses, four times daily, a sufficiency. It is well to omit it altogether every fifth day, and if the pulse becomes rather slow, to omit it every fourth or even every third day. This minimizes the danger of a cumulative effect. Unless the bowels are loose, which is seldom the case, he employs with good effect the following prescription:

℞ Magnesii sulphatis,
Potassii bitartratis (c. p.), āā ʒiij.
Triturate finely.

M. Sig.: Two teaspoonfuls in one-half glass of water on rising.

This prescription should produce two or three free watery stools, but the dose may be varied to obtain that result. In some instances, when the watery movements seem to cause debility, this prescription may be given on alternate mornings, or even three days apart.

For the distressing accumulation of gas in the stomach, which so embarrasses the heart's action, this prescription has proved most helpful:

℞ Spiritus anisi, fʒij;
Zinci phenolsulphonatis, gr. xv;
Magmæ magnesiæ, fʒijss;
Aquæ, q. s. ad fʒiv.

M. Sig.: One teaspoonful every fifteen to thirty minutes as needed for gas.

This can be repeated almost *ad libitum*. It can produce no bad effect, unless the magnesia acts as a hydragogue cathartic, and generally it promotes the free expulsion of the disquieting gas, of which the patient complains so bitterly. In many of these uncompensated cases there is frequent dyspnea, coming on after slight exertion or without apparent cause, or deepening in intensity during the hours of night.

The following combination, while it unfortunately possesses an odor both foul and fierce, has to many sufferers under his observation afforded a most grateful surcease for this distress:

℞ Spiritus ammonii aromatici,
Elixir ammonii valerianatis, āā fʒjss.

M. Sig.: One teaspoonful in water every fifteen minutes to one hour as needed for difficult breathing.

This, like the previous prescriptions, may be repeated quite a number of times.

Dietetic restrictions and regulations are most important, as they tend to diminish intestinal flatulence, to encourage intestinal peristalsis, to lighten the eliminative burden of the kidneys, and to promote general nutrition.

In the suggestive dietary herein offered, it will be noted that sweets and fats are avoided, so far as possible, and that vegetables containing only 5 and 10 per cent of carbohydrates are allowed, while the starchy foods are for the most part prohibited. Fresh lean meat may be eaten freely, but must be broiled, baked, or roasted. The string-beans, squash, onions, turnips, etc., may be cooked, but the green vegetables, usually eaten raw, may be cut up into a combination salad and flavored with lemon juice instead of the ordinary condiments. A limited amount of fresh buttermilk is admissible, and a small amount of cereal for breakfast, if the patient insists on it, as sometimes is the case. When cereals are eaten, a very scant amount of sugar may be permitted.

THE TREATMENT OF CHRONIC GASTRIC ULCER.

MOYNIHAN, in the *British Medical Journal* of December 13, 1919, expresses the hope that we may now agree that the results of the treatment of gastric ulcer by any of the systems already mentioned, or by any dietary or medicinal regimen, are vitiated by the lack of accuracy in the diagnosis of gastric ulcer. The most rational of all methods is that introduced by Sippy, which would appear to meet more combatively those conditions in the stomach which we believe must be controlled before an ulcer can have the chance to heal. It is based upon a recognition of the fact that the reduction of the acid in the stomach is the first necessity. This is attained by dilution of food, alkalinization of the gastric contents every hour, and by the administration of fats.

The questions which in this connection require answer are:

1. Does a chronic gastric ulcer ever heal under medical treatment?

2. Does it long remain healed?

3. Does it heal without producing such conditions as need surgical treatment for their relief?

1. Chronic gastric ulcers undoubtedly heal under treatment or after the exercise of continued care in diet. The scars left by their healing are seen in the post-mortem room and, very infrequently, in the operating theater. The discrepancy between the reputed frequency of gastric ulcer and the scarcity of the scars found in the dead-house has not attracted adequate attention. The number of healed cicatrices found in the operating theater, when the stomach is examined as a routine in almost all operations, is very small. This may be due to the rarity with which sound healing occurs, or to the tendency of healed ulcers to break out afresh.

2. Do ulcers when healed long remain so? In the majority of cases the answer must be "No." The characteristic quality in the symptoms of gastric ulcer is recurrence. There is a succession of "attacks," of changing severity and of variable length. The tendency on the whole is toward more serious attacks with briefer intervals. It is not by any means certain that an interval in which there is freedom from suffering means that the ulcer is healed.

3. When a gastric ulcer of moderate or large size heals there is inevitably some degree of contraction. In this way hour-glass stomachs are produced and stenosis near to the pylorus. We cannot say with what frequency the successful medical treatment of a chronic gastric ulcer produces the conditions which need surgical relief, but it is certainly not seldom, for any large scar wherever placed, and especially if it has contracted adhesions to neighboring parts, must embarrass the action of the stomach, or cause distress after food. Notwithstanding any or all of these considerations a really serious attempt to treat all cases of chronic gastric ulcer by medical treatment should be made. It is best to have no half-measures. It is at least arguable that the necessity for surgical re-

lief in many patients is due to a too perfunctory trial of medical treatment in the earlier attacks. The hospital accommodation is too small to allow of the poorer classes receiving the rest and supervision that is necessary. The pressure on beds is too heavy. The ideal would be to keep the patient under treatment until an *x*-ray examination showed that the ulcer was healed.

When a chronic gastric ulcer has refused to heal or has recurred, after medical treatment, surgical treatment is necessary. There is not yet any close agreement as to the procedure which is best adapted to the various types of cases, and there is not yet available a full record of the after-history of large groups of cases.

The operation of gastroenterostomy is that which has been most frequently practiced. Its success at first was wonderful, probably because only the cases of obstruction were then treated. Later its results appeared to be capricious. A small number of cases did well, a larger number were not satisfactory, some of the results were bad. The operation may be supposed to have two effects: a "mechanical" one, whereby the stomach is more readily drained, and a "physiological" one, as the result of which the gastric contents are alkalinized by the escape into the stomach of the pancreatic juice and the bile.

If an ulcer lies near the pylorus, or is distal to the new opening created by the operation, the results are often good; food escapes more readily, and does not, in the same degree at least, come into contact with the ulcer; and the spasm excited by the ulcer disappears in many cases. But in some cases the ulcer will not heal, or if it heals breaks down again, and a further operation is needed. In such cases Moynihan has performed gastrectomy. In other cases the ulcer certainly becomes malignant after the lapse of two years or more. In one of his own cases which he has formerly recorded, cancer occurred in the base of the ulcer treated by gastroenterostomy thirteen years before. Gastroenterostomy has also succeeded in cases in which the ulcer in the body of the stomach is of moderate size, and is free from any adhesions to neighboring parts; but in many cases it has certainly failed. That this operation alone cannot be of complete value is shown by the fact that fresh ulcers can occur in the stomach after it has been performed for duodenal ulcer. He has operated upon two of such cases. At the first operation in each the stomach was healthy. In both cases the ulcer was large and well away from the anastomotic opening.

There is a general agreement among those who have written upon the subject of the treatment of gastric ulcers that an important part of every method consists in counteracting the normal or the increased acidity of the gastric juice. If this effect is necessary, then the physiological effect of gastroenterostomy must play some part in causing the good results that do certainly follow at times upon its performance. Whether the partial or complete neutralization of the acidity is necessary to healing is, however, by no means as certain as is supposed; for in cases both of gastric and duodenal ulcer hyperacidity is sometimes found. According to Friedenwald a reduction of the acidity occurs in about one-fifth of the total number of cases of gastric ulcer, and in his experience in rather more than this proportion of cases of duodenal ulcer.

He has little faith in the "physiological" action of gastroenterostomy. If the access of bile to the stomach with its alkalinizing properties is proved to be of any value, it would surely be better to anastomose the gall-bladder to the stomach, as he has many times done in cases of carcinoma of the pancreas causing obstruction to the common duct. The entrance of bile into the stomach in these cases causes no discomfort whatever. Those surgeons who rely on gastroenterostomy alone in the treatment of gastric ulcer usually insist upon a protracted period of dietetic restriction, of rest, and of the administration of such drugs as the "triple carbonates." He is personally averse to the performance of gas-

troenterostomy except in cases of existing or threatened obstruction—that is, in cases of duodenal ulcer, or, in special circumstances only, of prepyloric ulcer. The whole matter requires fuller investigation; the effects upon the healing of the ulcer and upon the spasm of the stomach, as judged by *x*-rays, must be studied and the late results of the operations carefully recorded.

Gastroenterostomy may be combined with excision of the ulcer, or its cauterization (Balfour's operation); or the ulcer may be infolded in the manner practiced after perforation occurs. Excision alone Moynihan has discarded, partly because the ulcers occasionally recurred, and partly because such a deformity of the stomach followed as not seldom necessitated a short-circuiting operation. Balfour's operation has many claims to favorable consideration. It destroys the ulcer crater completely; it gets rid, therefore, of the tissues in which the carcinoma begins its development; it is simple in character, involves no great handling of parts, nor any exposure; it adds little or nothing to the dangers of gastroenterostomy alone. Local recurrence of the ulcer, so far as Moynihan is aware, has not taken place.

He saw the operation performed several times in Rochester, where the results were excellent. He has, however, practiced it seldom because he has felt that in the majority of cases of gastric ulcer it was better to perform partial gastrectomy. That appears to him the only way to make sure of curing the patient. There are, unhappily, certain cases in which gastrectomy cannot possibly be done—when, for example, in a patient who is ill and feeble and a "poor surgical risk" there is a large ulcer excavating the liver or the pancreas and extending up almost to the esophageal opening. In such a case an almost complete gastrectomy would be necessary, and a fatal result would be probable. In some such cases also Balfour's operation may be practiced. His own inclination is to perform gastroenterostomy in "Y" and at the same time to introduce a tube into the proximal limb of the "Y," and through this jejunostomy opening to feed the patient exclusively for months or years until the ulcer is shown by a radiograph to be healed. As a rule he gives nothing by the mouth; but perhaps bismuth and alkalies in large doses are helpful. In one case the patient took no food or drink by the mouth for thirty-three months. In this case the ulcer was the largest he has ever seen in any specimen, and the cure has been complete and permanent.

The advantages of gastrectomy over all other operations are that it does away, so far as Moynihan's experience goes, with any chance of recurrence of the ulcer, that it results in a complete and immediate freedom from all gastric troubles, and that it banishes the danger—it may be large or small, but it certainly is real—of a cancerous change taking place in the base of the chronic ulcer. In the last forty specimens removed on account of simple gastric ulceration, three showed early evidence of carcinoma. It is true that in the majority of cases an accurate discrimination between simple and malignant ulcers may be made. But no one is competent always to judge rightly; and it is safer to decide by microscopical examination in a captured specimen than to learn of a mistake from the late issue of the case.

SPINAL DRAINAGE AND INTRASPINAL INJECTIONS OF ARSPHENAMINIZED SERUM.

Dercum, in the *Philadelphia Weekly Roster* of December 27, 1919, states that it is a mistaken view that the nutrition of the nervous system is carried on by means of the cerebrospinal fluid. This has led to attempts to utilize the cerebrospinal fluid of the spinal subarachnoid space as a medium of medication. Noticeably has this been the case in the treatment of paresis and tabes by intraspinal injections of so-called arsphenaminized serum, the Swift-Ellis method. The belief has been that by this means the obstruction which the choroid plexus is supposed to offer to the arsphenamine could be circumvented.

He has already pointed out that substances introduced into the cerebrospinal fluid rapidly disappear, passing through the arachnoidal villi into the venous system without entering the parenchyma of the central nervous system in the slightest degree. If arsphenamine acts at all when introduced in simple solution into the spinal subarachnoid space, it is by irritating and inflaming the spinal membranes, and in a variable degree the other spinal contents. This is the legitimate inference to be drawn from the experience of Paul Ravaut and of others; unless at least the arsphenamine has been used in such small amounts as to be under any circumstances practically valueless. These conclusions doubtless apply with equal force to the introduction of corrosive sublimate and other antisyphilitic remedies via the subarachnoid route.

Dercum is of course well aware of the claims made in behalf of the Swift-Ellis and allied methods, especially in the treatment of tabes and of spinal syphilis of the exudative form, and to a less extent of paresis. For a long time he has made use of this method most extensively in his clinic and in his private work, and he can confirm the claims made as to undoubted improvement in tabes and spinal syphilitis and of apparent improvement from time to time in paresis. He has, however, for several years past come to the conclusion that the improvement does not depend upon the intraspinal injection of the salvarsanized serum, but upon the drainage of the spinal subarachnoid space which must inevitably be practiced before the injection is made.

Several years ago Gilpin, chief of his clinic, conceived the idea that it would be a good plan to practice spinal drainage at the time of giving salvarsan intravenously in the hope that the intraspinal pressure being reduced, the salvarsan circulating in the blood would be more likely to diffuse into the subarachnoid space. Later Gilpin together with Earley instituted simple spinal drainage alone. The results were striking. Marked improvement occurred, which was more pronounced than that observed in the Swift-Ellis method, and doubtless because the drainage was more thorough. The improvement was most decided, as might have been expected, in tabes, but was also very evident in paresis. The patients are put to bed and drained of every possible drop of fluid about once a week, once in ten days, or once in two weeks, in some cases twice weekly. There is an immediate reduction of the increased intradural pressure; secondly, the drainage results in a kind of lavage of the dural space; for the spinal fluid which has been removed is rapidly replaced. In keeping with this fact there is a fall in the lymphocyte count. Further, there is normally a balance between the pressure in the blood-vessels within the cord and the pressure of the surrounding cerebrospinal fluid. It follows that if the pressure of the cerebrospinal fluid be abnormally increased, the vascularity of the cord will be correspondingly diminished; less blood than normal will be able to enter its vessels. It would appear, therefore, that the rapid withdrawal of the cerebrospinal fluid is followed by an increase in the vascularity of the cord—a relative hyperemia—and, other things equal, of the brain as well. Probably the results—often truly remarkable—which follow radical spinal drainage are to be attributed to the improved nutrition following this increased vascularity.

We have here a parallel to the results of the Bier method in surgery. It should be added that he has never noted any untoward results from spinal drainage in either paresis or tabes. That the diagnosis—previous to drainage—should definitely exclude brain tumor and brain abscess goes, of course, without saying. Finally it is interesting to note that the reason why the pressure of the cerebrospinal fluid is pathologically increased in tabes and paresis is because its outflow is obstructed. It would appear that the inflammation of the membranes, the meningitis, present in these affections leads to an occlusion more or less pronounced of both the arachnoidal villi and the lymphatics. The cerebrospinal

fluid continuing to be formed, a rise of pressure necessarily follows. Spinal drainage is therefore in both tabes and paresis directly indicated.

For a long time past Dercum has abandoned in his clinic the Swift-Ellis method. He has relied altogether upon intravenous injections of arsphenamine and mercurial inunctions together with spinal drainage, and his results have been better than previously, doubtless because he gave especial attention to the drainage, removing at each occasion all the spinal fluid possible. Finally, in a number of cases, he has practiced spinal drainage alone and always with improvement.

It is upon the incidental spinal drainage, practiced in the Swift-Ellis and allied methods, he repeats, that such success as has attended the procedure depends, and not upon the apochryphal amount of arsphenamine contained in the serum. He is entirely in accord with the position assumed by Sachs as to the uselessness and unnecessary character of the method. Besides, Sachs tells us that with Benedict he has succeeded in showing that salvarsan introduced in the usual quantities into the blood current appears in the cerebrospinal fluid in appreciable quantities. Sicard and Bloch have likewise noted the same fact, the arsenic making its appearance in the cerebrospinal fluid an hour after the intravenous injection. Kopke also noted the presence of arsenic in the cerebrospinal fluid after the administration of atoxyl in trypanosomiasis. Even admitting, therefore, that the presence of salvarsan in the cerebrospinal fluid is of any consequence, no pretext can any longer exist for the intraspinal injections of "salvarsanized serum."

The difficulty with the various antisyphilitic remedies at our command is not that when introduced by the mouth or parenterally they do not pass through the epithelium of the choroid plexuses, but because they do not pass through the walls of the capillaries. The reason that the iodides, mercurials, and salvarsan are so efficacious in syphilis of the exudative and the gummatous form is because in this form the spirochete has invaded especially the lining membrane and the walls of the blood-vessels and the immediately contiguous tissues. These structures are all of them directly accessible to the action of remedies circulating in the blood. The walls of the capillaries, however, offer an obstruction to their entrance into the pericapillary and perineuronal spaces. Therefore no action by such remedies can take place on the nervous parenchyma. How seriously the latter is invaded in both paresis and tabes, we all know. It is here that the difficulty lies and not in the barrier by the choroidal epithelium. An element of hope is presented in that the walls of the blood-vessels do not offer the same rigid barrier as does the choroidal epithelium so necessary to the preservation of the integrity of the cerebrospinal fluid. We know that the capillaries do permit various drugs to pass through; among these are the alkaloids, morphine, cocaine, caffeine, theine, quinine, various salts such as bromides, various narcotics such as trional, sulphonal, various urea derivatives such as veronal, medinal, luminal, besides urotropin, and the volatile anesthetics; doubtless many other substances could be enumerated. It would seem that the walls of the capillaries are especially impervious to substances containing the ions of the metals.

Two things appear to be necessary to the conquest of parenchymatous nervous syphilis: one, an increased knowledge of the biology of the spirocheta pallida, and the other, the development of a diffusible and innocuous spirocheticide based upon this knowledge. In other words, the problem is one of biology and biochemistry.

Dercum briefly summarizes the conclusions which the above considerations of the cerebrospinal fluid appear to justify in his opinion:

First, the cerebrospinal fluid is preëminently a fluid for the hydraulic suspension of the brain and cord; its function is essentially hydrostatic.

Second, its chemical constitution is essentially that of the innocuous three-quarter-

per-cent common salt solution of the histological laboratory. It has no action upon the tissues with which it comes in contact; it is absolutely neutral and negative.

Third, it is distributed through the ventricles and subarachnoid spaces. It has no relation with the perivascular, pericapillary or perineuronal spaces.

Fourth, it possesses no function of and plays no rôle in nutrition. The nutrition of the brain and cord takes place, as does that of the other tissues, through its blood-vessels, the perivascular spaces playing the same rôle as to the perivascular lymph spaces in the other organs and tissues. The old belief that the brain and cord have no lymphatic system must be abandoned.

Fifth, the cerebrospinal fluid has its source in the choroid plexuses and perhaps in the general serous surfaces of its containing cavities. It leaves the subarachnoid spaces of the cranium by passing through the arachnoidal villi into the venous current of the sinuses; also to a less extent by the lymph sheaths of the cranial nerves; from the spinal subarachnoid space it passes out by the lymph sheaths of the spinal nerves.

Sixth, attempts at medication of the brain and cord through the subarachnoid space, as in the Swift-Ellis method, are unscientific, as substances introduced into the cerebrospinal fluid rapidly disappear by passing out through the arachnoidal villi and the lymph spaces without in the slightest degree penetrating the nervous parenchyma; the beneficial effects hitherto ascribed to the Swift-Ellis and kindred methods are due entirely to the incidental spinal drainage.

Seventh, medication of the nervous parenchyma must be attempted through the alimentary tract, through the skin, through the areolar tissue, or directly through the blood.

Eighth, a remedy should be sought whose ions will readily osmose through the capillary walls.

Ninth, spinal drainage is urgently indicated in tabes and paresis for the reasons enumerated in this paper.

WOUND SHOCK.

The *Lancet* of December 20, 1919, reminds us in an editorial that in the summer of 1916 intravenous infusion with normal saline was employed on a large scale with discouraging results, although at one clearing station treatment in a special ward by warmth, quiet, and fluids was successful in apparently hopeless cases. In the early spring of 1917 one of the surgeons from a clearing station was given opportunities for making blood-pressure observations in the trenches, which established the predominating effect of cold in the production of shock in wounded men. The use of gum saline was suggested by Bayliss in 1916, and gradually became general. In the summer of 1917 Cannon took part at Bethune in a system whereby both clinical and laboratory observations were made on a certain number of serious cases from the time of the receipt of the wound, during the journey down the trenches, and in the ambulance to the clearing station, where observation was continued through the operation and until the commencement of convalescence.

Wound shock, as it was now called, was thus classified into primary and secondary. In the few primary cases the blood-pressure was found to be lowered immediately after receipt of a wound, and profound constitutional disturbance was already present. In the greater number, even with such injury as gunshot amputation or penetrating abdominal wound, no untoward symptoms arose, nor did the blood-pressure drop until such factors as cold, hemorrhage, and toxemia, bacterial or otherwise, were brought into play.

The conception of secondary wound shock now became clear and definite, and accordingly a vigorous campaign was started against shock. In every regimental aid-post arrangements were made for the réchauffement of patients, who thus arrived at the station fit for operation. The resuscitation ward became an established institution, with a sufficient number of beds ever ready for wound-shock cases. Medical officer, sister, and orderlies formed

a team to heat up and infuse with blood or gum saline all patients requiring it. Enthusiasm being aroused, gum infusion in the actual line was practiced, and men were thus kept alive to reach the clearing station. Reduced alkalinity of the blood was at first thought to be one of the causal factors in shock, but later it became clear that the acidosis was a result and not a cause of the lowered blood-pressure. Experimentally it was shown that on raising the blood pressure by infusing gum solution the normal alkalinity of the blood returned.

From the sum total of experimental and laboratory work four facts ultimately emerged as characteristic of wound shock, namely: (1) Increased capillary permeability; (2) reduced blood volume; (3) arterial hypotension; (4) consequent intracellular anoxemia, leading to cerebral changes and finally death.

This being but a summary of a long series of reports of surpassing interest, what is the application of all this research work and war experience to every-day civilian practice? Wound shock occurs daily in accidents in street and factory; surgical shock is not yet banished from our operating theaters. In the first place, those who are responsible for the teaching and supervision of first-aid should impress on all concerned the importance of the preventive treatment of shock. The value of efficient splinting, early arrest of hemorrhage, and prevention of chill cannot be overestimated. Stretchers should be abundantly provided with blankets and hot bottles, and motor ambulances heated electrically or otherwise. In the casualty departments of hospitals means should be at hand for warming up the patient while waiting to be examined or treated. In the operating theater a few electric lamps under the table are easily controlled and are safer than hot bottles. In the private nursing home a suitable oil lamp placed under the table will vastly affect the condition of the patient at the end of operation. Sisters and nurses everywhere should be made fully alive to the effect of cold in the production of shock. The operator has his special contribution to make in the form of speed, gentleness, and attention to hemostasis. If shock develops, fluids are given by mouth or rectum, or, in urgent cases, by a vein, gum saline having more lasting effect than normal salt solution. Blood transfusion has its place in civilian surgical practice, and the apparatus, together with a suitable donor, should be available at every large hospital. Applied in this way one of the greatest surgical lessons of the war will not have been learned in vain.

FUNCTIONAL HEART DISTURBANCES IN WOMEN.

MEREDITH, in the *Boston Medical and Surgical Journal* of December 25, 1919, states that the importance of differentiating between the underworked and the overworked heart is quite obvious. Both kinds are found in each class of girl, the working girl and the college girl, but in the main she believes the former needs more activity and the latter less, or at any rate a change in the variety of activity.

Weakness of the heart muscle due to lack of normal development is the real trouble in many hearts which might easily be confused with those showing organic disease. Out of the series of 800, of which not one belonged to the "heart invalid" class, it is reported that 442 had never had their hearts examined before, although many of them felt that they had heart trouble, or, strange to say, lung trouble—the dyspnea on exertion being often interpreted as lung weakness. Of the 358 who had been previously examined, 193 had been told by physicians that they had heart trouble, usually valvular, and had been advised to work as little as possible and rest all they could. Since few of them could do either of these things they were in a poor psychic condition, thinking that they were probably slowly killing themselves by unavoidable labor, and seeking every opportunity for idleness, often going from one job to another seeking a "soft" one. Their favorite

recreation is the moving picture show, because there they can sit still. Many of them, even in the class most addicted to dancing, never dance. Even if the physician does not supplement his diagnosis of heart trouble or valvular trouble by advice to keep quiet and rest, he might as well do so after telling the girl the diagnosis, for the girl herself will not believe that anything but rest will keep her in health and save her life, or that activity will eventually help her. An underdeveloped condition of the myocardium, however, is something that a girl can be made to understand, and is something which she will try to improve.

Out of a group of five of the most active physical directors it was recently found that each of the five had been told at one time or the other that she had valvular disease. But these girls had each felt such a yearning for activity they had refused to consider the diagnosis of any importance in shaping their lives, and went on their way into athletics, none of them ever having heard from the valvular heart trouble. At the present time four of them show quite normal hearts, their trouble having been previously either mildly strained hearts which recovered their balance with the attainment of full growth, or slightly underdeveloped hearts. The other has now a well-compensated mitral lesion, which has undoubtedly done better on the régime the girl planned for herself according to her own feelings and desires than it would have on the régime of limited activity which is so often started upon the finding of a lesion. But these were exceptional girls in that they did not allow themselves to be restricted. The average girl does not yearn for activity very much, and not at all if she has any suspicion she is going to injure her health by it.

Too many diagnoses have placed the possibility of improvement forever beyond reach, rather than constructively embodying the cure in the diagnosis. It is certain that comparatively few cases of irregularity and tachycardia and comparatively few murmurs in the whole series of 2000 cases meant organic disease of the heart, and that myocardial subdevelopment can be brought up to normal by suitable bodily activity, strengthening the heart along with the other muscles. Ordinary factory work will not do it, nor will sitting reading and embroidering and crocheting, nor going to evening school or the movies. The process which must be gone through is the same in theory and almost the same in practice as that required to promote compensation in a diseased heart, with the difference that while in the latter case we get a heart artificially developed to be adequate to its ordinary somewhat limited purposes, in the former case we produce a normal sound heart, good for anything in reason. Much is to be gained by considering as few hearts as possible in the category of "sick" hearts, and as many as possible in the category of underdeveloped hearts.

STUDIES IN THE TREATMENT OF MALARIA.

The *Indian Medical Gazette* for December, 1919, states the following conclusions, arrived at from studies in the treatment of malaria by Stephens, Yorke, Blacklock, and Macfie:

An intramuscular injection of quinine bihydrochloride, 15 grains in 2 Cc. of water, on each of two consecutive days only, causes the cessation of febrile paroxyms and effects the disappearance of trophozoites from the cutaneous blood in malignant tertian malaria. The action, however, is only temporary, a relapse occurring within three weeks, occasionally within a few days.

As a palliative, quinine sulphate 30 grains on each of two consecutive days weekly, over a period of five weeks, suffices to keep the blood free from trophozoites and to prevent relapses in the great majority of cases. It is noteworthy that the percentage of cases having crescents in the peripheral blood diminishes each week, viz., from 50 per cent in the first week to 6 per cent in the fifth week of treatment.

Under quinine treatment, 30 or 45 grains daily, crescents do not persist in the

cutaneous blood in the majority of cases for more than three weeks.

Novarsenobillon in the doses used is of no value in the treatment of malignant tertian malaria.

A combination of arsenic (novarsenobillon or liquor arsenicalis) with quinine in the doses used is not more effective than quinine alone.

The action of novarsenobillon on plasmodium vivax is marked. In this infection its action is even more rapid and efficient than that of quinine, a single intravenous injection of 0.9 gramme causing the disappearance from the cutaneous blood of all stages of the parasites within twenty-four hours. In the case of P. falciparum and P. malariæ novarsenobillon in the same dosage has no appreciable effect on the temperature or on the parasites.

An intramuscular injection of the bihydrochloride of quinine, 15 grains on each of two consecutive days only, exerts in the case of P. vivax a constant and rapid effect both on the temperature and the parasites; in the case of P. falciparum the action on the temperature and trophozoites is also well defined, though relapses occur more quickly than in the case of P. vivax, whilst in the two cases of P. malariæ treated in the same way there is little if any effect on the parasites, but in one of the two cases the temperature was controlled.

Quinine hydrochloride in the doses used is of no value in the treatment of simple tertian malaria.

VACCINES IN INFLUENZA.

WATTERS, in the *Boston Medical and Surgical Journal* of December 25, 1919, states there is practically a unanimity of opinion in favor of the idea that active immunization by the use of vaccines may be obtained, a fact which while not, of course, to be considered as scientific proof, still should be considered to have distinct value. Another interesting note is found in the comment upon reactions. These, while infrequent, were almost always mistaken for the beginning of influenza, being characterized by sudden chill, fever, headache, and prostration, persisting for a few hours and subsiding gradually.

It may be of further value to note in combining the figures, excluding the Bridgeport Board of Health and the Lovell & Covell Company, where comparisons are indefinite, that there was disease incidence among those inoculated of approximately 3.5 per cent, while at the same time among others not inoculated the disease incidence amounted to 28 per cent under similar surroundings. Among those immunized the incidence of pneumonia was very low, there being only fifteen cases definitely reported. The total of eight deaths has been reported, these all coming from the Allentown State Hospital, where three of the patients had received but one inoculation, and three, two inoculations. Apart from this the mortality records are clear.

In preparing this paper the writer fully realizes the fact that epidemics afflict first those most susceptible, and that measures for immunization employed later upon those not yet infected may consist of administering them to persons already naturally immune. As such, it is obviously unfair to compare early morbidity among a non-immunized community and later morbidity among a hopeful partially immunized one after the most susceptible have already become diseased.

In the Allentown report, however, this possibility seems to be successfully met when it is noted that of those vaccinated persons contracting the disease 36 per cent did so within one week of the first inoculation when the immunity should be theoretically only beginning, and 57 per cent did so after the fourth week when the immunity was decreasing. It would suggest that for a period of three or four weeks a distinct degree of resistance to infection might be produced.

Again, in the report of Phillips no inoculated nurses in the hospital with which he is associated contracted the disease until after three weeks subsequent to inoculation, even though constantly exposed.

Leard also reports occurrence of the disease in vaccinated cases later than four weeks after inoculation.

These notes seem strongly to suggest that there is a period of three to five weeks subsequent to inoculation during which a distinct degree of immunity exists.

BOILED VEGETABLES FOR THE USE OF DIABETICS.

CAMMIDGE, in the *Lancet* of December 27, 1919, states that purely starchy foods are not, as a rule, well borne by diabetics, and they are consequently replaced to a large extent in the modern diabetic diet by vegetables. When the carbohydrate tolerance of the patient is low many vegetables cannot be taken without glycosuria resulting, and the range of the diet therefore becomes very restricted. It was pointed out by Von Noorden that boiling vegetables in water removes some of the carbohydrate, so that a much larger bulk of a boiled than of a raw vegetable can usually be taken by a diabetic without harm. He showed that raw spinach containing about 2.97 per cent of carbohydrate will when cooked in water yield only about 0.85 per cent; also that 100 g. of ripe peaches containing 9.5 g. of carbohydrate contain only 1.8 g. after boiling and changing the water.

Carrying the idea further, Allen has suggested that thrice-boiled vegetables might be even more useful, especially in instances where ordinary boiled vegetables are not well tolerated, for he states that by boiling through three waters and throwing away the water nearly all the starch can be removed. It is claimed that vegetables prepared in this way are taken gladly by most severe cases of diabetes and without glycosuria. Very little experimental work appears to have been done on the composition of the material resulting from the treatment of vegetables with three changes of boiling water. It has been generally assumed that any vegetable of low carbohydrate value is rendered practically carbohydrate-free, while vegetables of high carbohydrate content, and particularly root vegetables, should not be used. With a view to throwing some light on the question and discovering which are the best vegetables to employ for the purpose, a number of experiments were carried out in his laboratory.

Sixteen varieties of commonly used vegetables were investigated. The root vegetables were cut into slices about an eighth of an inch thick and then into strips about half an inch wide; the others were cut into convenient lengths about half an inch long. They were soaked in cold water over night, then put into a large excess of fresh cold water, brought to the boil, and boiled for a quarter of an hour. This water was drained off, and they were again boiled for a quarter of an hour in a fresh supply. A further boiling in fresh water for a quarter of an hour completed the process. After each boiling a sample was taken for analysis. The reducing sugar was estimated by the process he has described, and the "total carbohydrate" was determined by the same procedure after hydrolysis with a mineral acid. The figures obtained are summarized in Table I.

TABLE I.—*Thrice-boiled Vegetables.*

A, Total "carbohydrate" per cent. B, Reducing sugar per cent.

—	Raw.		After 1st boiling.		After 2nd boiling.		After 3rd boiling.	
	A.	B.	A.	B.	A.	B.	A.	B.
Celery	2.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0
Rhubarb	2.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0
Spinach	4.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Turnip, sliced	5.5	4.0	3.5	3.0	1.5	1.0	0.0	0.0
Carrot, "	8.5	2.5	4.5	0.5	2.0	0.0	0.0	0.0
Onion, Spanish,	5.0	0.9	3.0	0.7	1.0	0.5	0.1	Tr.
Beetroot, sliced	12.0	0.8	3.0	0.4	1.5	0.0	0.4	0.0
Cauliflower, stalk	9.0	1.2	8.3	1.1	3.3	0.7	0.4	0.2
Cabbage	3.3	0.7	2.3	0.0	1.5	0.0	0.5	0.0
Sprouts	4.5	1.5	3.2	1.0	2.1	0.5	0.6	0.1
Parsnip, sliced	11.0	3.0	8.0	2.5	4.0	1.0	0.6	0.0
Seakale	4.0	1.2	3.0	0.3	2.0	0.1	0.6	0.0
Cauliflower, flower	4.0	1.2	3.0	1.0	2.0	0.6	0.8	0.3
Artichoke, sliced	18.4	1.1	10.0	0.8	5.0	0.4	1.0	0.0
Potato, "	15.0	0.9	10.0	0.7	5.0	0.5	1.0	0.2
Swede, "	6.5	3.5	4.5	2.0	2.5	1.5	1.0	0.5

It will be seen that the number of boilings required to secure a carbohydrate-free residue varies considerably and is not directly related to the amount of carbohydrate originally present; moreover, that comparatively a small proportion of the vegetables investigated were entirely freed

by three boilings. Celery, rhubarb, and spinach were free from carbohydrate after the second boiling; sliced turnip and sliced carrot still retained some starch, but were free after the third change; all the other vegetables retained more or less carbohydrate even after three boilings. It is noteworthy that cabbage, which contained only 3.3 per cent of carbohydrate originally, and is generally regarded as a safe vegetable for diabetics, especially in the thrice-boiled condition, retained 0.5 per cent after the third boiling, whereas a sample of carrot containing 8.5 per cent of carbohydrate in the first instance was free from starch and sugar after three boilings. Again, beetroot, with 12 per cent of carbohydrate when purchased, did not contain more after three boilings than cabbage similarly treated; thus showing that some root vegetables can be made quite as harmless as the green vegetables usually prescribed.

From these experiments it is clear that three boilings are not sufficient to render all vegetables carbohydrate-free, and that the amount of carbohydrate originally present is no guide in selecting those best suited for the preparation of a starch-and-sugar-free product such as may sometimes prove useful instead of actual fasting for children or severe cases of diabetes. It would seem that celery, rhubarb, spinach, sliced turnip, and sliced carrot can probably be relied upon and are the best to use for the purpose. It should be noted that Swedes cannot be employed in place of white turnips, for although they contain nearly the same percentage of total carbohydrate they part with it much more slowly and may contain one per cent after three boilings, about half of which is reducing sugar. Even when thrice-boiled vegetables are not quite free from carbohydrate the percentage is so much reduced that from four to thirty times as much of the thrice-boiled as of the once-boiled material will contain the same amount of carbohydrate. The use of the former, therefore, permits of a much greater bulk of food being taken. As reducing sugar is removed much more rapidly than the "total carbohydrate," and some of the reduction given by the latter is probably due to pectins and indigestible bodies of a similar nature in some instances, the proportion which can be safely allowed is often larger than these figures would suggest.

Repeated boiling considerably impairs the flavor and appearance of vegetables, and although their lack of taste can be masked to some extent by serving them with condiments, clear broth, bovril, lemco, and in some instances by sweetening with saccharin, they are not very attractive to most patients. Experiments by Ruth A. Wardall suggest that a more tempting and equally carbohydrate-free product may be prepared from some by repeated extraction at a temperature considerably below the boiling point of water. The vegetables are finely shredded, covered with an excess of water at 60° C. (140° F.), and allowed to soak. At intervals of ten to fifteen minutes the water is drained off and fresh water at 60° C. added. When this process is repeated at regular intervals the time required to free certain vegetables from available carbohydrate was found to be as shown in Table II.

For comparison the number of extractions with boiling water required to produce the same results are given in Table III.

TABLE II.
Extraction at 60° C.

Beet	1 hour.
Parsnip	1 "
Carrot	1½ "
Egg plant	2 "
Pineapple	3½ "
Cabbage	little affected.

TABLE III.
Extraction at 100° C.

	A.	B.
Beet	2	Trace.
Parsnip	6	0.4
Carrot	6	0
Egg plant	7	0
Pineapple	9	—
Cabbage	8	Trace.

A. Highest number of extracts showing carbohydrate.
B. Carbohydrate in residue per cent.

These experiments are only of a preliminary character, but the effectiveness of the extraction at 60° C. in the case of beetroot and carrots, for instance, and the better appearance and flavor secured than when boiling water is employed, suggest that an agreeable extension of the often limited range of vegetables open to severe cases of

diabetes may be obtained by this method of preparation. The extracted vegetables can be preserved for future use by desiccation in a current of air from an electric fan for 3½ hours. Stored in a dry place they keep indefinitely, and may be prepared for use when required by soaking in water and reheating.

THE SCHICK REACTION FOR THE DETERMINATION OF SUSCEPTIBILITY TO DIPHTHERIA.

LEETE, in the *Lancet* of January 24, 1920, concludes that: (1) The Schick test appears to be of definite value in detecting diphtheria susceptibles, and as such has many possible applications. (2) It is easy to perform and free from any danger. (3) A reliable toxin and careful technique are essential. (4) Once the differences between a positive and a pseudo-reaction are appreciated reading is easy, but if there is any doubt controls of heated toxin should be used. (5) The best times for readings are 24 hours, 3 days, and 10 days after the test.

ANAPHYLAXIS.

The *Indian Medical Gazette* for December, 1919, in an editorial states that as horse serum is at present the vehicle of antitoxic injections, and as the human subject may suffer much when sensitized to horse serum, the problems of how to lessen the poisonous characters of the serum, and how to increase the resisting power of the organism, arose very early in the study of anaphylaxis. Besredka carried out a series of experiments on these points. If an antidiphtheric serum be heated to 59° C. and no higher, for an hour on three consecutive days and for two hours on the fourth day, it becomes only one-third as toxic as if it were unheated, as may be seen when it is injected into a sensitized guinea-pig. It is to the systematic heating of antisera which obtains in France that he attributes the freedom from serum-accidents when French antisera are used.

He found that ether narcosis absolutely protects a sensitized guinea-pig from the effects of a lethal dose of serum given subdurally. Also that if such a guinea-pig be rendered unconscious by means of alcohol, it is protected against a lethal dose, and this protected condition lasts for twenty-four hours.

Morphine and opium have, however, no such protective action. These were important discoveries, but they are as naught compared with his discovery that by means of small doses it is possible to "vaccinate" a sensitized animal, so that it can tolerate a dose even a thousand times greater than what would otherwise be a lethal dose of the substance.

In his work "Anaphylaxis and Antianaphylaxis," of which an English translation has recently appeared, Besredka, after describing the intravenous method of injection as the most convenient and also the most rapid means of inducing desensitization (antianaphylaxis), writes as follows:

"We begin by testing this sensitiveness by introducing intravenously as weak a dose as is desired—0.1 Cc. of serum, for example. (The serum is diluted to ten times its volume with physiological saline solution, and 1 Cc. of this dilution is injected.) If the patient does not react at the end of three to five minutes, another injection of 0.3 Cc. of serum is given (3 Cc. of the dilution) without withdrawing the cannula. We again wait two minutes, and if nothing happens we inject 1 Cc. of serum (10 Cc. of dilution)."

To be certain that antianaphylactic immunity is acquired it is necessary to proceed to the dose which he terms "precritical," the effect of which is shown in man by the onset of anxiety and a redness of the face lasting some minutes. It is a sure indication, and from this point of time onward the patient is desensitized, and is in a position to tolerate with impunity as much serum as it is desired to administer.

The precritical dose may be varied in different subjects according to the degree of hypersensitiveness manifested by the particular individual. The principle is that we should act in practice as if we were

always dealing with individuals who are most hypersensitive, and, commencing with weak doses, as above indicated, proceed rapidly without stopping if we see the patient does not react to them and go on injecting stronger and stronger doses till the precritical dose is attained.

He compares anaphylaxis and anti-anaphylaxis to the phenomena observable when a flask of strong sulphuric acid has water added to its contents. If the addition be very gradual nothing untoward happens, the acid becoming gradually weakened; but if the addition be sudden and in large amount an intense reaction takes place and the flask is shattered.

Anaphylactic shock itself brings about the desensitization of the animal, but is too violent to be a safe means of doing so.

IMMUNITY IN HEALTH.

The London *Lancet* of December 27, 1919, contains an interesting review of a book bearing this title by Digby, Professor of Clinical Surgery and Anatomy in the University of Hong Kong. The facts mentioned are of such clinical interest that we think them worthy of repetition.

The functions of the tonsils and other subepithelial lymphatic glands in the bodily economy are dealt with by Digby in a novel and arresting manner in this handy little volume. If the title is a little too comprehensive and the microdiagrams a little crude, these minor deficiencies are amply compensated for by the clarity of the author's arguments. Darwin, amongst others, is saddled with the responsibility of teaching that the tonsils, adenoids, and vermiform appendix are dangerous relics of a past usefulness. Digby holds that these organs, which with the solitary follicles and other lymph nodes of the gut are collectively termed the subepithelial lymphatic glands, constitute a very valuable antibacterial mechanism and are the prime factors in the development of individual immunity. Large numbers of bacteria pass into the subepithelial lymphatic glands and are attenuated by the lymphocytes, and this process of attenuation is completed in the red marrow. The cells of the glands are of two kinds—the small lymphocytes and the endothelial cells. The former, Digby assures us, are both motile and phagocytic, and the latter ingest the former when these return to the glands laden with bacteria. The small lymphocyte in the blood is also probably motile and phagocytic. This much would appear to be confirmed by the fact that an increase of small lymphocytes accompanies infective granulomata, and also malaria, measles, mumps, and whooping-cough. If lymphocytosis were not purposeful, why should it occur at all? The glands in question protect against measles, cerebrospinal fever, and influenza; also against the inroads of the alimentary bacteria. They are anatomically and chronologically situated at the point of maximum aggregation and minimum protection against bacterial influence. There is a gradual atrophy when with age individual immunity is secured. Appendicitis begins as a lymphadenitis, and is followed by ulceration, which progresses or cicatrizes according to the resisting powers. Subepithelial lymphadenitis is the beginning of sore throats, peptic ulcers, typhoid fever, and appendicitis. As the author points out, "an occasional attack of tonsillitis is a cheap ransom to pay for immunity from general infections of far greater frequency and severity," and, indeed, it is clearly proven that diminished bacterial resistance may eventuate from indiscriminate removal of tonsils and adenoids.

Digby advises greater moderation in these matters, and we are inclined to agree with him that nature is not so foolish as to have planted these organs for the mere benefit of surgical handicraft. At the same time the author in nowise denies that under modern civilized conditions, particularly in England, these organs frequently become grossly pathological, and that then their removal becomes an urgent necessity. *"Suaviter in modo, sed fortiter in re"* exactly if tritely epitomizes the attitude which Digby sets forth in this connection.

ENLARGED THYMUS GLAND IN INFANCY AND ITS TREATMENT BY RADIUM.

BRAYTON and HEUBLEIN, in the *Boston Medical and Surgical Journal* of December 25, 1919, state that the diagnosis of enlarged thymus must be made both from the history and physical examination. If cough, stridor, or cyanosis is present in the history it is suggestive, but when the history is negative, examination alone must suffice.

Inspection often reveals a flabby, poorly muscled child with a bulging of the upper front chest. Some authors have described the gland as visible in the suprasternal notch during inspiration, but in only one of their cases were they able to duplicate these findings. Percussion generally gives an area of dulness extending either side of and continuous with the usual hyperresonance of the upper sternum. The dulness, as a rule, is more pronounced on the left, but unless very light percussion is employed the entire area will be obscured by the transmitted resonance of the underlying lung.

Often when dyspnea and retraction are slight, they may be accentuated, or when absent may be produced, by gently extending the head over the edge of a pillow. This procedure, however, should never be resorted to in extreme cases for fear of sudden death.

The one diagnostic means which stands above all others, and the only one which is infallible, is the *x*-ray. By its use the contour of the gland may be seen normally projecting but little either side of the sternum, and continuous with the heart shadow—compared often to the neck of a gourd extending up to the clavicles. Normally the sides of the shadow are concave, while the enlarged gland gives an outline the sides of which are both displaced laterally and bent convexly. The left lobe of the gland is usually enlarged more than the right, which corresponds with the percussion findings. Great care must be exercised in placing the child flat on the back during the exposure, for otherwise the mediastinal structures will be projected obliquely, with a resulting worthless negative.

The treatment of enlarged thymus is simple and specific; it consists solely in radiotherapy. Although for over a decade the *x*-ray had been employed to decrease the size of the gland, the method did not come into general use until about four years ago. Even then the technique of treatment varied so in the hands of different workers that contradictory reports arose as to its efficacy. The matter was finally clearly defined in 1917 when Friedlander published a series of over a hundred cases in only four of which *x*-ray therapy was not successful. He attributed his good results partly to his standardized method of treatment, which consists in using a tube of known penetration, a constant target-skin distance, a filter of certain thickness, a definite length of exposure, and repeated treatments.

Two years ago one of the writers was asked to see an infant who was in a desperate condition from thymic asthma. Roentgen-ray treatment was advised and the case referred to the other writer, who suggested that, owing to the extreme severity of the case, radium be substituted in the hope that its effect might be more prompt. Radium had produced such marvelous shrinkage of certain tumors of other structures that it seemed justifiable to apply it in this nearly moribund case, even though its use in this condition had never been reported in the literature. The results of this substitution were so satisfactory that ever since radium has been used exclusively in both hospital and private cases.

The technique of treatment is as follows: 100 milligrammes of radium element, still in its 0.3-millimeter silver capsule, is wrapped in sufficient gauze so that when strapped to the chest by a strip of adhesive it will lie a half-inch from the skin surface. Four marks are made in the form of a rectangle over the thymic area, and the nurse is instructed to allow the package of radium to remain two hours over each mark. This makes a total exposure of 800 milligramme hours. From the moment a diagnosis of enlarged thymus is made the child's head should be kept in a flexed posi-

tion, thus lessening the severity of the asthma and the possibility of sudden death.

Judged solely from the end-results, there is little choice between radium and *x*-ray. By both methods a cure is obtained, provided the child survives the effects of thymic pressure until the radiotherapy has had opportunity to reduce the gland. Radium does have certain advantages over the Roentgen ray which may be summarized as follows: The action of radium is more rapid; with radium one treatment alone suffices to effect a cure, even in the severest forms of the disease; radium is portable, thus obviating the difficulty of transporting the patient to a Roentgen laboratory; the application of radium is simple, thus eliminating the dangerous element of fear from the mind of the patient, and at the same time rendering unnecessary the use of an elaborate *x*-ray equipment and highly skilled operator.

THE PROLONGED SERUM TREATMENT OF HEMOPHILIA.

The *Lancet* of December 27, 1919, in an editorial states that for the serum treatment of hemophilia we are indebted to Émile-Weil. At a meeting of the Académie de Médecine of Paris on November 25 he returned to the subject and showed the value of prolonged administration. In 1907 he reported to the Congress of Medicine at Paris the case of a man, aged twenty-six years, who since infancy manifested hemorrhages with quasi-regularity—hemarthroses every month and hematuria four times a year. He was injected six times during a year with serum, human or animal, and the hemorrhages ceased. At the same time his blood, which coagulated in 4½ hours before the treatment, showed only the slightest delay in coagulation. The case was followed for five years, during which 20 Cc. of serum were injected every three months at first and then every two months. No spontaneous hemorrhages occurred, but the blood did not become altogether normal, and the hemophilia persisted in slight degree, for when he cut himself he bled more than a normal person, but never dangerously. Of the great number of hemophiliacs who have been under Émile-Weil's care only six others submitted to prolonged treatment. Five obtained the same attenuation of the disease and the complete disappearance of recurrent hemorrhages (hemarthroses, hematomata, etc.). The abnormalities of the blood greatly diminished but never disappeared. In the sixth case the amelioration was the least; the recurrent hematomata continued.

The curative action of serum injections in hemophilia is generally admitted, but what Émile-Weil insisted on was the preventive action of continuous treatment. By it the diathesis can be made to "age" artificially in a few months, a process which naturally requires years. It is curious that although the injections give the most favorable conditions for severe manifestations of anaphylaxis such never occurred. One patient received 30 injections in six years, others 20, and still others 12 without ever being really ill. Nothing more serious than some fever, slight anthropathy, or urticaria was observed. These complications appeared most irregularly. One patient showed them on the seventeenth injection, though he never had them before or afterwards. Others had them after the first and not the later injections. Émile-Weil therefore thinks that there should be no hesitation in adopting this treatment, which completely transforms a disease of serious prognosis.

WASSERMANN CONTRADICTIONS CONSIDERED FROM THE CLINICIAN'S POINT OF VIEW.

In the *New York Medical Journal* of January 31, 1920, WOLBARST states that the Wassermann test and the gonorrhea fixation test should be made by at least three serologists working independently; the serum should be taken simultaneously and sent to the different laboratories under identical conditions; one serologist is not to be depended on, however capable he may be.

Three serologists will agree in approximately fifty-three per cent of Wassermann tests and approximately forty-two per cent of gonorrhea fixation tests. That is, the chances are about fifty-three in a hundred that three serologists will agree on any given serum. Curiously enough they are more likely to agree in the negative cases than in the positive cases. Probably the serologists can say why this is so. At all events, it is well to devote more study to the clinical features of our cases and trust not quite so implicitly to our laboratory workers for our diagnosis.

RADIUM TREATMENT OF UTERINE HEMORRHAGE.

KENNEDY, in the *Medical Record* of January 24, 1920, states that in the treatment of excessive hemorrhage from small fibroids radium is the ideal treatment. It will not stop the hemorrhage but will produce a retrogression of the tumor. Clark, Kelly, and others have made reports on the treatment of uterine fibroids with radium, with which many are familiar.

Radium has not displaced surgery in the treatment of fibroids, but in selected cases it has proven of great value.

In the treatment of uterine carcinoma it is invaluable. In all forms of uterine hemorrhage radium has proved to be a valuable agent, and as the technique becomes standardized it will be more effective.

THE ADMINISTRATION OF ARSPHENAMINE BY RETENTION ENEMA.

In the *Medical Record* of January 24, 1920, MANDRACCHIA concludes: (1) That the administration of arsphenamine by retention enema is a successful and practical method of giving this powerful drug, and, therefore, the method demands a place in the therapy of syphilis. (2) The slow absorption is an advantage and prevents the production of nitroid crises. (3) In children it is the method of choice. (4) The contraindications to this method are *nil*. (5) The results obtained by this method are just as good as those obtained with the intravenous method. (6) What better method can there be where a patient with very fine veins is encountered? The question always is, How many vein dissections is your patient going to tolerate?

THE TREATMENT OF MALARIA IN MACEDONIA.

In the *Lancet* of January 24, 1920, PHEAR states that a very short experience in Macedonia was sufficient to bring home to all those concerned with the management of malarial cases the limitations of quinine treatment. Side by side with its remarkable power in controlling the more acute manifestations of the disease and its special importance in such conditions as cerebral malaria, when the life of the patient may depend on its proper use, there was accumulating evidence of its inadequacy in preventing the recurrence of relapses. Innumerable observations were made both at the base and in crop areas with the object of testing the value of quinine in relapse prophylaxis. Many of these have been published, and he wishes only to allude to the results obtained by Anderson, in the special malaria wards set apart for observation purposes at a base general hospital. In these wards the best results in the prevention of relapses were obtained by the so-called week-end system, in which 30 grains of quinine were given on each of two consecutive days in each week. By this method the percentage of non-relapse cases was increased to 78 per cent, as compared with 32 per cent in the control series, in which no quinine was given after the initial pyrexia had subsided. No inconvenient symptoms arise from the larger week-end doses in the case of patients treated in hospital, but equally good results may be obtained by the same weekly quantity of quinine distributed in daily doses of 10 grains for six days a week, a plan of treatment which has undoubted advantages in the case of individuals who are occupied in their daily work, as has been pointed out by Sir Ronald Ross.

NOTES ON BLACKWATER FEVER IN MACEDONIA.

In the *Journal of the Royal Army Medical Corps* for January, 1920, PHEAR states that the three essentials in the treatment of blackwater fever were found to be: (*a*) Rest: (*b*) protection against chill by suitable coverings, hot-water bottles, etc.; (*c*) the introduction of large quantities of fluid into the system with the object of maintaining a free flow through the kidneys and thereby lessening the risk of suppression of urine. Whenever possible cases were treated in hutted hospitals; but in cases arising at a distance it was not considered justifiable to expose the patient to the risks involved in a journey to the base, and such cases were treated at the nearest tented hospital or casualty clearing station. As far as practicable the requisite amount of fluid was given by mouth; but in cases of vomiting or when it was required to supplement the amount taken by mouth, the subcutaneous, rectal, or intravenous routes were utilized. The slow rate at which fluid is absorbed subcutaneously, or per rectum, rendered these channels preferable to the intravenous route. Rectal injections were usually given in quantities of fifteen to twenty ounces of normal saline at intervals of four or six hours. In a few cases continuous rectal saline was administered up to five or six pints in the twenty-four hours with very satisfactory results; the fluid is absorbed as it flows into the rectum, and the method is free from drawback other than the slight inconvenience caused by the presence of the rectal tube. Dry cupping over the loins appeared in some cases to be beneficial. For the treatment of vomiting and the obstinate hiccough Sternberg's mixture containing sodium bicarbonate and bichloride of mercury was given in some cases, but without any marked degree of success. In a few instances these refractory symptoms were checked by hypodermic injections of hyoscine (1/100 grain) combined with morphine (1/6 grain).

The usual practice as regards quinine has been to withhold it in the absence of definite evidence of active malaria. The presence of parasites in the blood, or of tenderness over an enlarged spleen, has been taken as an indication for quinine, which has been given in effective doses until the malarial manifestations have been brought under control.

After the subsidence of acute symptoms a generous and varied diet has been found essential to the establishment of a satisfactory convalescence. Arsenical preparations are of great value in promoting blood formation. Arsenic has been given (*a*) by the mouth, either alone or in combination with iron; (*b*) subcutaneously in the form of sodium cacodylate; (*c*) intravenously in the form of galyl in doses of 0.2 or 0.3 gramme at intervals of four days; three doses are generally sufficient. In a few cases of extreme anemia galyl has been used with remarkable benefit; in cases of anemia of ordinary severity the subcutaneous and intravenous methods do not offer any special advantages over the method of oral administration except in cases in which on account of gastric disturbance it is undesirable to push arsenic by the mouth.

METABOLISM IN LEUKEMIA AND CANCER DURING RADIUM TREATMENT.

ORDWAY, TAIT, and KNUDSON, in the *Albany Medical Annals* for January, 1920, state that it seems evident that the changes in the nitrogenous metabolism depend upon the amount and nature of tissue autolysis. Both the tissue autolysis and the products of nitrogenous metabolism are most marked in two cases of leukemia which they report. In these two cases also the phosphates show an extraordinary increase due to the nature of the tissue autolyzed. In another case of sarcoma the bulk of tissue autolyzed was obviously less than in the cases of leukemia, but following radiation there was definite softening and fluctuation of the growth. The nitrogenous products in this case, while definitely increased, were much less so than in the cases of leukemia above referred to. In the case of carcinoma of the breast the lesions consisted of hard, brawny, fibrous tissue in which one would expect little or

no autolysis. In this case there was practically no increase in the products of nitrogenous metabolism and only a moderate increase in the total acidity of the urine.

From the above it would appear that the changes in the urine, as a result of the radiation of the pathological conditions above referred to, are due in part at least to the products derived from autolysis of the abnormal tissue under the influence of the radiation from radium. The above results throw no light upon the nature of the constitutional symptoms which have been described resulting from the radiation of radium and of the *x*-ray. Only one of these cases showed any systemic reaction because of radiation, and in this instance the nitrogenous substances in the urine did not show as excessive increase as in the cases of leukemia which showed no general symptoms of toxemia.

THE PROTEIN SHOCK REACTION.

The *Journal of the American Medical Association* of January 3, 1920, in an editorial upon this topic states that when vaccine therapy came into vogue many years ago, one of the points on which the earlier writers laid emphasis was the specificity of the reaction. As time has gone on more and more doubt has been expressed regarding this specificity. It has been shown experimentally that a variety of substances of a protein nature are capable, when introduced into the body, of causing a reaction on the part of the body cells and fluids with the stimulation of the immunity-producing mechanism. Practical advantage of these studies in the treatment of disease was first sought in this country. Among the earlier studies were those of Miller and Lusk, of Cecil, and of Gay, which indicated the possible value of this form of treatment.

In typhoid fever to some extent, but particularly in the treatment of various forms of arthritis, the administration of protein has proved of value. Such administration leads to a reaction that is now spoken of as the protein shock reaction, and this reaction is indeed the greatest drawback to the treatment. Patients capable of reacting to the treatment usually have a severe chill with fever and very often headache and general pains, which may be accompanied by nausea and vomiting and may last for several hours. This is accompanied by a primary fall and a secondary rise in the leucocytes, which may be taken as an indication that the tissues are reacting. Recently Gow has substantiated previous studies regarding the reaction on the part of the leucocytes and the general reaction on the part of the patient. While the method is not one that has as yet been widely used, it seems to merit more extensive, careful study.

TREATMENT OF SEASICKNESS.

The *Medical Record* of January 31, 1920, in an editorial calls attention to the fact that the resumption on a large scale of the ocean passenger traffic makes this subject timely. Dr. Cazamian discussed it in the *Bulletin générale de thérapeutique* for November, 1919, clxx, 17. He has devoted the past two years to the subject as visualized in the latest developments of science. Quite inevitably seasickness must be restudied in the light of endocrinology and the pathology of the sympathetic. The author has studied over 50 seasick people, and finds that in the fully developed status naupathicus the arterial tension is increased. However, the tension drops while the illness is still present. The oculocardiac reflex was inverted in most patients, but pressure in the pit of the stomach usually accelerated the pulse. The spinal fluid obtained by puncture showed no constancy, while the blood counts were within normal limits. The author found a prevalence of sympathicotonia attributable to hyperadrenia, although Naame has reported the exact converse—vagotonia from hypoadrenia. This disparity probably means that initial sympathicotonia passes eventually into the opposite condition or, more accurately, that stimulation of the adrenal cortex leads in time to exhaustion of it. Certainly seasickness is largely a matter of adrenal-autonomous pathology. Crises of vomiting

are vagotonic—paroxysmal vagotonia. But the sympathicotonic patient is naturally predisposed to seasickness, whereas the vagotonic enjoys some immunity. The young child, being naturally vagotonic, is immune. From this angle treatment is simple. The vagotonic paroxysms of vomiting and other critical manifestations are relieved by hypodermics of atropine, 1 or 2 mgm., and the other vagotonic standby—adrenalin—is a valuable synergist whenever there is a condition of hypoadrenia. If the tension is up adrenalin aggravates. It is better to give suprarenal extract by the mouth in these cases than to inject adrenalin.

ENLARGED THYMUS SYMPTOMS AND TREATMENT.

BROOKS, in the *Ohio State Medical Journal* for January, 1920, states that different methods of treating an enlarged thymus causing symptoms have been tried. At first thymopexy was used with very poor results. Intubation did no good, as the point of compression was below the reach of the tube.

Thymectomy gives great relief in a number of cases, with a mortality of about 11 per cent, but the operation is a serious one and is advised only in severe cases.

Friedlander was the first one to treat this condition by the use of *x*-ray, and the results in many cases have been nothing short of marvelous. At first, difficulty was encountered in regulating dosage, because of the limited knowledge of the use of the *x*-ray, but at the present time the dosage can be accurately estimated and the results are most gratifying. Improvement in the most alarming cases is often obtained in from eighteen to forty-eight hours, with sometimes almost total abatement of symptoms which have existed for months.

The treatments in the average case are given at intervals of a week, and from three to six treatments given, the child being kept under observation and brought in later for subsequent exposures, if necessary.

In urgent cases full doses should be given, repeated in three or four days, the child being kept under close observation, so that the unfortunate accident of death during the treatment may not occur.

In cases of asthma in which no enlargement of the gland can be demonstrated, the therapeutic test of *x*-ray treatment should be given, and a most gratifying result will very often be obtained.

Organotherapy has been tried with very poor results, as so little is known about the functions of the gland.

Among the cases which have come under Brooks's observation, two illustrate the different types of cases met with, although we may have milder types of cases between these two:

Case 1. Baby B., aged three months. Breast-fed, well nourished. Since birth has been cyanotic, with intense dyspnea, inspiratory and expiratory stridor, head held back, and a hoarse, asthmatic cough. Examination of chest shows both lungs filled with dry râles and a very long-drawn-out inspiration and expiration. Mother says child cannot sleep lying down, and at times the symptoms would become so alarming, especially during a crying spell, that it seemed as if the child would die at once.

Percussion over the thymus showed slight dulness to right of sternum.

X-ray confirmed the diagnosis of enlarged thymus, and a treatment was given at the same time the picture was taken. The parents, who lived about 20 miles away, were told to return in four days, but did not return for one week.

The baby at this time was breathing comfortably, no cyanosis present, and could sleep lying down, all the symptoms being markedly improved. Another treatment was given, with instructions to return in one week. They did not return for any more treatments, and as they have not been heard from since, the child apparently had no further trouble.

Case 2. Baby F., also breast-fed; two months old, well nourished; nothing abnormal noted until the child was three weeks old, when it had a series of slight convulsions with some cyanosis and subsequently had a rise in temperature for several days.

No doctor was called as the child began to improve and rapidly became normal. She was apparently in perfect health until she was five months old, when the attacks occurred in which he saw her. When first seen the child had a temperature of 104°, seemed in intense pain, and at intervals of fifteen minutes to one hour would take a short convulsion, become blue, the heart practically stop beating, the child becoming pale and apparently dead. With external stimulation, atropine hypodermically, mustard baths, hot towels, etc., the heart would gradually begin to pick up in rate, the child becoming very red and would start crying again. This condition lasted for about six hours and gradually passed away.

After running a temperature for several days it returned to normal, and the child was apparently well. A diagnosis of enlarged thymus was made, which was confirmed by *x*-ray, and treatment given, with no return of the above noted symptoms after five months.

He concludes: (1) The function of the thymus gland is still a much disputed question. (2) Whether sudden death in children is caused by mechanical compression of an enlarged thymus or by changed secretions from the glands is still undecided. (3) *X*-ray is the most valuable method of confirming our diagnosis and our very best method of treating the condition.

PREOPERATIVE CARE OF HYPERTHYROIDISM.

HAINES, in the *Ohio State Medical Journal* for January, 1920, states it is almost needless to say that any surgical procedure in the preoperative management should be done under local anesthesia.

Large numbers of these patients who have had symptoms over a long period of time, before coming under observation, are found to be carrying badly damaged hearts and suffering from some degree of acidosis.

Not to elaborate a theory, but merely to record a clinical observation, he assures us that marked improvement in force and endurance of the heart muscle follows relief of the acidosis, all too frequently placed in the realm of coincidence.

Tachycardia, jaundice, dry skin, fissured nails, constipation, loss of appetite, extreme restlessness, albumin, granular and hyaline casts are some of the prominent features in the neglected cases.

The interest of such patients is best subserved by placing them in a darkened room in a quiet part of the hospital, excluding visitors and administering alkalies and carbohydrates.

General tonics and heart tonics, preparations of digitalis, or in case of failing compensation, strophanthus and chloral or bromide to promote quiet, induce rest and sleep, are of signal value in the preoperative management of the patient. The patient should receive a nutritious, well-selected diet, and a full dose of castor oil daily.

Morphine for its well-known physiological influence in checking secretions should be reserved as a last resort, and the solution of the bimeconate of morphine should be administered in doses of 1 Cc. to 4 Cc. if the urgent demand for morphine arises. Full doses of tincture of belladonna, 4 Cc. to 6 Cc. given three times daily for a week, will cut down the excessive bronchial secretions with which these patients annoy the anesthetist at the time of operation. [We would prefer atropine.—ED.]

Haines has had his share of extreme hazards in this type of operative work, but in no instance has his anesthetist found it necessary to resort to phantom anesthesia and other deceptive procedures prior to operation on the gland. On the contrary, he is fully convinced from practical experience that the full confidence and hearty coöperation of the patient are of inestimable value in the preoperative management of all goitrous patients.

Incipient and other forms of tuberculosis, malignancy, diabetes, and other general physical conditions, should receive recognition and proper treatment when they are coexistent with hyperthyroidism. By careful study of the patient's physical condition and strict attention to the general details of preoperative management as herein out-

lined, one may convert an extremely unsafe into a fairly safe surgical risk and proceed with the final operation.

Finally, Haines knows of no other class of cases, not even excepting the aged and infirm prostatic, wherein painstaking, prolonged preoperative treatment and acute discernment in selecting the time to operate are more essential to success than in patients suffering from the late manifestations of hyperthyroidism.

INTRAVENOUS INJECTIONS OF HYPERTONIC GLUCOSE SOLUTION IN INFLUENZAL PNEUMONIA.

In the *Journal of the American Medical Association* of January 10, 1920, WELLS and BLANKINSHIP state that the beneficial effects of an intravenous injection of glucose solution are most striking in those patients who are critically ill, and who present the toxic symptoms commonly observed in this disease, as nausea and vomiting, anxiety, restlessness, vasomotor disturbances, shown by cyanosis, rapid, feeble pulse, a cold, clammy skin, and a dry, coated tongue and mouth. In many instances, a change occurring shortly after the injection to a state of well-being seemed almost miraculous. Frequently the patient would fall into a restful sleep before the completion of the injection.

Among 112 patients in one group there were no deaths; among 124 patients in the second group there occurred eight deaths; and among eighty-three patients in the third group there occurred fifty-four deaths. The mortality rates for each group being: Group 1, 0; Group 2, 6.45; and Group 3, 65.06. It was expected that the mortality would be lower among those patients receiving glucose early, yet in Group 2 there occurred eight deaths among eighty-seven patients receiving glucose injections during the first three days of the disease, while among thirty-seven patients to whom the injections were not given until after the third day there were no deaths. The number of cases as well as the number of deaths in this group is too small to warrant drawing of any conclusions from these results. In Group 3 there occurred thirty-four deaths among fifty-one patients receiving injections during the first three days of the disease, while among thirty-two patients receiving the first injection after the third day there occurred twenty deaths, the death-rate being slightly lower in the latter. Two points must be considered before any conclusions are drawn in regard to Group 3 cases: first, that a hopeless prognosis had been made in all these cases; and second, that by the end of the third day some of the patients had probably developed a certain amount of immunity. Quite significant is a definite shortening of the febrile period in those cases in which glucose was received prior to the third day; in each group this time was reduced practically 50 per cent. Complications were too few to warrant the drawing of any conclusions relative to the influence of glucose injections on their occurrence.

The majority of patients in this series received injections of a 10-per-cent glucose solution. The lowest death-rate occurred among those patients receiving a 15-per-cent solution, and the highest among those receiving a 5- and 25-per-cent solution. The number of cases in these three series differs so slightly that the inference that a 15-per-cent solution is the one of choice is probably not warranted. The death-rate in the group of cases in which the 10-per-cent solution was used is 19.4 per cent, the average for the entire series of 319 cases being 19.1 per cent. From their experience they have not been able to demonstrate that the injection of a 25-per-cent solution would be more efficacious than a weaker solution, but possibly its use in a larger series of cases would bring out this advantage.

The occurrence of the so-called "protein reaction" following the injection of glucose solution is mentioned by Litchfield; they encountered it in forty-two instances, or 13.4 per cent of the patients injected. Erlanger and Woodyatt and Wilder and Sansum have given a large number of glucose injections without the occurrence of such reactions. Concerning what may be the responsible factor for this phenomenon

they confess ignorance. It has been suggested that failure to remove all foreign matter from the solution may be responsible. Opposed to this suggestion is a condition that they have several times observed: In attempting to provoke a therapeutic protein reaction, they have repeatedly failed after the addition of 1 Cc. of killed typhoid bacilli mixture to 250 Cc. of glucose solution, and this occurred in patients who previously and afterward showed a typical reaction following the injection of the same amount of the bacterial mixture diluted in 2 Cc. of physiologic sodium chloride solution. They are certain that no harm has resulted from the occurrence of this reaction, and, as reported elsewhere, it may have a definite therapeutic value.

The mechanism by which glucose solution aids in recovery is somewhat complicated and probably not altogether known; undoubtedly both the ingredients present in the solution play a definite rôle. Litchfield has emphasized that the process of dehydration in serious diseases is especially potent for evil because least appreciated and consequently neglected in treatment. The introduction of several hundred cubic centimeters of water directly into the blood stream immediately tends to correct this dehydration. The introduction of hypertonic solution into the blood stream would render the blood hypertonic if it were not for several changes which occur to maintain a state of isotonicity. The value of the glucose solution lies in part in the occurrence of these changes. As the glucose solution enters the blood, there at first is a withdrawal of fluids from the body tissues sufficient to maintain an isotonic condition of the blood. That this is probably the case is shown by the fall in the hemoglobin content of the blood following such injections; and also blood chemistry studies of blood taken during and shortly following the injections show a normal sugar content. The latter finding may possibly be due to a withdrawal of the glucose from the blood as rapidly as it is injected; but it may also mean a dilution of the blood by fluids extracted from the tissues of the body. This condition is not due to the elimination of glucose from the body through the kidneys, for in their cases glycosuria was uniformly absent. The occurrence of the extraction of fluids from the tissues, as just assumed, would only tend to increase the degree of dehydration in the tissues of the body, if it were not for the fact that the glucose is rapidly taken up by the tissues. This process is increased by the condition of starvation present in the tissues, and makes demand on the blood for fluid which is necessary in the physiologic process of cell metabolism; this brings about a reversible flow of fluids to the tissues, and tends to neutralize the tissue dehydration.

In diseases characterized by toxin production, either from the products of the infecting organisms or from the products of catabolism, with the extraction of fluids from the tissues there is considerable washing out of toxins into the blood stream, from which these may be more readily eliminated through the kidneys.

In addition to the influence of the glucose solution on the condition of dehydration, it has also a marked effect on the condition of starvation, characteristic of most serious infectious diseases. Lusk has pointed out that there is a certain amount of stimulation of cell activity by glucose, in addition to its purely food value. The marked improvement in the pulse following glucose injections would suggest a possible direct stimulation of the cardiac muscle.

The authors do not know how to account for the marked improvement in desperate cases following glucose injections, unless it is due to the theoretical processes that have just been mentioned. One is struck by the rapid improvement in many cases: patients previously restless and semidelirious have dropped into a restful sleep during the course of an injection, the anxious, toxic look has disappeared, and the hot, dry skin has become moist. The tongue, previously dry and coated, has become moist. The appetite for foods and liquids becomes less capricious and is stimulated. The urinary output is increased.

Wells and Blankinship conclude: (1) The intravenous injection of glucose solution is a valuable aid in the treatment of serious cases of pneumonia. (2) The results following are almost immediate, but are not necessarily lasting; and success may follow only after repeated injections. (3) The injection of glucose solution is not more difficult than the injection of other intravenous medication. (4) It is not intended that glucose solution should be substituted for antipneumococcic serum in cases of Type I infections; it may, however, be added to the serum treatment.

SOME PRACTICAL CONSIDERATIONS WITH REGARD TO SYPHILITIC AORTITIS.

Babcock, in the *American Journal of Syphilis* for January, 1920, reminds us that Warthin has shown most convincingly how great is the predilection of the spirocheta pallida for the heart and aorta, and that he has been able to detect the organism in these structures even after what was thought to be energetic specific medication. How great, therefore, is the error for a person with lues to fancy himself safe after the disappearance of objective and subjective symptoms. The watchword for all syphilitic patients should be eternal vigilance.

Numerous instances could be cited of the recognition of aortic syphilis without resort to a blood test, and hence the following points may be mentioned: (1) If a person either male or female in the late thirties, early forties or still later in life furnishes signs of aortic regurgitation, minute inquiry should be instituted regarding the etiologic factor, and if no evidence can be found of previous streptococcus infection, as inflammatory rheumatism, tonsillitis, scarlet fever, etc., suspicion should attach at once to the likelihood of syphilis. (2) The patient's denial of a chancre should not be considered sufficient, especially if gonorrhea is admitted. (3) Not infrequently it will be learned on close inquiry that the aortic regurgitation has appeared within the last few years, and that the man may have been accepted for life insurance five or ten years previously and that no streptococcus infection occurred in the meantime. (4) Careful percussion over the sternum generally detects more or less dulness of the manubrium extending into the first interspace at either side, while the subclavian arteries often pulsate visibly above the inner and middle third of the clavicles. (5) There is rarely a palpable systolic thrill in the aortic area at right of the sternum, but a perceptible systolic impulse may be felt, and generally a distinct to-and-fro murmur replaces the two aortic tones. (6) Whereas in some instances of pronounced insufficiency of the aortic valves from inflammatory rheumatism similar findings are found, it is likely that signs of aortic dilatation are less pronounced, while one of the aortic tones may be heard as well as the murmur, and frequently there is a systolic thrill.

As is well known, syphilitic aortitis leads sooner or later to dilatation of the arch and consequent stretching of the ostium and regurgitation. Regurgitation may not necessarily attend a saccular aneurism, but such instances are rare as compared with those cases in which leakage does not take place. Given the above points in a man of forty or over, the chances are in favor of a syphilitic mesaortitis, and yet be it remembered this is not limited to the male sex.

Finally, Babcock emphasizes most strenuously the necessity of the most vigorous antisyphilitic treatment in all such cases. He believes that thorough mercurial medication, with or without salvarsan, should be resorted to from time to time practically for the rest of the patient's life even after reliable blood tests are declared negative. The damage done the heart and aorta cannot be repaired, and possibly the spirochetes in the tissues may not be reached, but the beneficial effects of prolonged and oft-repeated treatments by means of mercurial rubs and injections (not by the oral administration of mercury or iodides) have been demonstrated in so many of his cases that he offers this as the one practical consideration of this communication.

INDUCTION OF ANESTHESIA AND ANALGESIA BY ORAL ADMINISTRATION OF VARIOUS DRUGS, WITH A REPORT OF CASES.

FICKLEN, in the *New Orleans Medical and Surgical Journal* for January, 1920, gives the following formulas, which were used clinically:

FORMULA 1.

Ether, 4 fluidrachms;
Liquid petrolatum, 4 fluidrachms;
Peppermint water, 5 minims.

FORMULA 2.

Paraldehyde, 1 to 3 fluidrachms;
Ether and liquid petrolatum, equal parts to make 1 ounce;
Peppermint water, 5 minims.

FORMULA 3.

Ether, 3½ fluidrachms;
Liquid petrolatum, 4 fluidrachms;
Peppermint water, 5 minims.

FORMULA 4.

Chloroform, ½ to 1 fluidrachm;
Ether, 3½ fluidrachms;
Liquid petrolatum, 3½ fluidrachms;
Peppermint water, 5 minims.

Method of Administration.—The author recommends, at the suggestion of Major Lower, that port wine be given before and after the dose. He states that rinsing the mouth thoroughly with the wine disguises the taste of the drug effectively. As a substitute one may employ undiluted whisky. Probably yerba santa could be used to better advantage. The taste of Formula 4, as he knows from experience, while pungent, is not as unpleasant as that of castor oil.

Approximately sixteen cases are reported, in most of which ether liquid petrolatum was given. One vomited; three fell into a light sleep. The administration of a half-dose gave unsatisfactory results. Extensive dressings were done without pain; the patients had no headache, and woke with good appetites. Formula 4 was given in approximately thirty cases, and it is a more satisfactory mixture than the others. Detailed case reports, however, are not presented.

Ether oil by mouth was also used as a supplement to chloroform anesthesia. An extensive operation on the knee-joint was performed in this way with the use of only two drachms of chloroform.

In his conclusions he states that ether, chloroform, and liquid petrolatum when swallowed in the quantities stated produce a safe general analgesia, accompanied in nearly all cases by light anesthesia.

Vomiting occurs in a small proportion of cases.

Alarming symptoms have never been observed.

The effects of the drugs are intensified and prolonged by the administration of morphine.

The ether oil mixture is not as powerful as the formula to which chloroform has been added. This conclusion is reached by comparing the case report of Drs. Gwathmey and Karsner with his own.

Ficklen thinks the field of usefulness of the procedure should be broadened. Enough cases have already been observed to show that it is of value in painful dressings and as a supplement to general anesthesia. It has not been used, as far as he has been able to ascertain, in gynecological examinations where relaxation is necessary, in suspected malingering, in manipulation of ankylosed joints, nor in obstetrics.

Since the method is yet in its infancy, further tests should be made to determine its status in surgery, and the above suggestions are made with this in view.

CHEMOTHERAPEUTICS OF THE CHAULMOOGRIC ACID SERIES AND OTHER FATTY ACIDS IN LEPROSY AND TUBERCULOSIS.

WALKER and SWEENEY, in the *Journal of Infectious Diseases* for March, 1920, in summarizing an article on this topic, state that chaulmoogra oil contains bactericidal substances that are about one hundred times more active than phenol.

The bactericidally active substances of chaulmoogra oil are the fatty acids of the chaulmoogra series, chaulmoogric and hydnocarpic acids, and possibly lower isomers of this series.

The bactericidal activity of the chaulmoogric acid series is specific for the acid-test group of bacteria, and inactive against all other bacteria tested.

This specific bactericidal activity against

acid-fast bacteria is a function of the carbon ring structure of the molecule of the chaulmoogric acid series which, so far as known, is found only in chaulmoogra oil and in oils of certain plants closely related to Taraktogenous kurzii.

The fatty acids of cod-liver oil, the salts of which constitute Rogers's sodium morrhuate, used in the specific treatment of tuberculosis, do not possess the specific bactericidal activity of the chaulmoogric acid series.

These facts supply a scientific basis for the use of chaulmoogra oil and its products in leprosy.

Their experiments do not support the claims of Rogers for sodium morrhuate in the specific therapy of tuberculosis.

The bactericidal activity of the chaulmoogric acids against all members of the acid-fast group of bacilli, together with the clinical results obtained from their use in leprosy, furnish theoretical grounds for the application of the chaulmoograte to the therapy of tuberculosis.

Experiments on animals are now in progress to determine whether or not the chaulmoogric acid series have any practical value in the chemotherapy of tuberculosis.

DIAGNOSTIC SIGNIFICANCE OF THE FIRST SOUNDS OF THE HEART.

CRUMMER, in the *American Journal of the Medical Sciences* for January, 1920, states a 3-4 rhythm always means degenerative hypertrophic heart muscle, which is on the verge of "failure' in Mackenzie's interpretation of this word.

Furthermore, demonstration of the 3-4 rhythm is a positive indication for the administration of digitalis, which will usually restore the normal rhythm. If not treated with digitalis the case very soon progresses to the usual manifestations of conclusive decompensation. Since a very much larger percentage of cardiovascular-renal cases finally break under heart symptoms than is generally believed, eliciting this 3-4 rhythm as an early sign of approaching heart muscle weakness is of great value.

Behavior of the first sound in the various forms of cardiac irregularity presents many interesting features. For instance, in mitral insufficiency of the type described above, the long systolic murmur and no first sound, with ectopic beats, the first sound is heard over the apex with the premature contraction, and usually seems louder, the earlier and more incomplete the ectopic beat. This also holds true in cases of tricuspid insufficiency in which the same condition can be demonstrated over the right ventricle.

In mitral stenosis with fibrillation the snappy first sound is heard only with those systoles which present a normal pulse wave, and inasmuch as fibrillation of the auricle does away with practically all diastolic murmurs a diagnosis of mitral stenosis again depends upon comparison of the first sound right and left.

VENEREAL DISEASES AS WE SEE THEM TO-DAY.

MCDONAGH (*The Practitioner*, January, 1920) observes that propaganda work has succeeded in opening the eyes of the public to the dangers of venereal diseases, with the result that the patient comes up for treatment at an earlier stage than formerly. It has failed to reduce the incidence of venereal diseases.

The vivid and exaggerated pictures which have been drawn of the rarer sequelæ of these diseases have given the public false impressions, and victims have become so terrified that there has been produced a venereal neurasthenia, which is infinitely more difficult to cure than the actual disease itself.

Although the prophylactic measures used have saved many from infection, at the best it is only shutting the stable door after the horse has been stolen. It is a pity to issue "prophylactic packets," when micturition and washing with soap and water immediately after connection are simpler and just as efficacious. Possibly because of the simplicity of this teaching, which hailed from the medical school of Salerno four or

five centuries ago, it was thought that more reliance would be placed by the public upon special outfits. Because mercury has been used for syphilis since the disease came to Europe, when it was confounded with scabies, which had been treated with mercury for hundreds of years before, and because Metchnikoff had found that rubbing calomel ointment into a scarified wound on a monkey's forehead—an insult to which the penis is seldom subjected—prevented infection with syphilis, and because potassium permanganate has been used in the treatment of gonorrhea for so long, it was thought that the outfits should contain both calomel and potassium permanganate. As a matter of fact, tubes containing a semiliquid colloidal mercury cream, and supplied under the name of serenol, are equally as good and certainly more convenient than the dual outfits.

After a review of this subject McDonagh states without hesitation that venereal pathology as at present constituted is a curse to both patient and doctor.

The spirochæta pallida can be demonstrated by most observers in only 6 per cent of chancres.

A negative Wassermann reaction means nothing, while a positive is only strong presumptive evidence that the patient has had syphilis. A positive reaction does not necessarily mean that the lesion in question is syphilitic, nor that the patient is actively syphilitic, nor that he requires treatment. A positive reaction may be an indication of the patient's protective action against the disease.

Owing to the varied morphology of Ducrey's bacillus and to the difficulty encountered in demonstrating it, scraping a soft sore is in most cases futile.

In subacute, chronic, and recurrent cases of gonorrhea, in both men and women, the gonococcus cannot be demonstrated in more than 15 per cent of the cases.

A positive complement fixation test in gonorrhea is frequently an indicator of the patient's resistance against the disease, but it by no means signifies that the disease is active or that the patient requires treatment.

A clinical diagnosis of any visible lesion should not be accompanied by so much as a one-per-cent error. Clinical observation and experience are the only reliable guides when it comes to a question of deciding whether the patient has an active lesion or not; whether further treatment is required or not; and whether a patient is fit to marry or not. As a very large number of syphilitics, for the remainder of their earthly existence, give a positive Wassermann reaction, which is uninfluenced, or only temporarily influenced, by treatment, more good can be done by telling the patient that the reaction is useless as a guide to treatment than by prescribing an unlimited number of courses of arseno-benzene. To-day, venereal diseases are suffering from being overtreated; especially is this the case with gonorrhea. Overtreatment for syphilis has two dire results: (1) metallic intoxication; (2) nerve involvement.

NORMAL AND MORBID CONDITIONS OF THE TESTES FROM BIRTH TO OLD AGE IN ONE HUNDRED ASYLUM AND HOSPITAL CASES.

Mott (*British Medical Journal*, Dec. 6, 1919) states that he examined post mortem an emulsion of the brains of a successive series of 100 cases of general paralysis of the insane by dark-ground illumination, and found the spirochæte present in 66 per cent. The Wassermann reaction can be obtained as a rule in 97 per cent of these cases.

Mr. Geary has similarly examined the seminal fluid obtained post mortem from the seminal vesicles of 50 cases of general paralysis; also an emulsion of the testicles. Spirochætes have not been seen once.

The family history of fifty-four male tabic or tabo-paralytic patients showed that they had 151 children alive, 75 who were born alive but died in early infancy, and 52 born dead or miscarriages. Of 25 female tabic or tabo-paralytic patients, 10 of whom

were sterile, the remaining 15 had 10 children alive, 10 who were born alive but died in infancy, and 51 miscarriages or stillbirths.

Tabes and paralysis do not arise on the average until ten years after infection. It is possible that in these diseases the spirochætes have a biological disposition to enter the brain and spinal cord. It is apparent that acquired dementia is due to the direct action of the toxins of the spirochæte on the brain. Even though this destruction is great it does not cause any generalized arrest of spermatogenesis. Many of these cases die of generalized tuberculosis, others of bronchopneumonia or dysentery, yet active spermatogenesis existed in many of the tubules even although there were gross signs of testicular involvement. In genital syphilis the spirochætes may invade the testes in common with other organs of the body. There can be no doubt that syphilis in parents will lead to infantilism of the offspring. Only one individual of a family of congenital syphilitics may exhibit this sign of the disease. Bacteriological examination of the testes in dementia precox tends to show that a precocious senility of the germ plasm is a fundamental physiological principle in this disease. The author summarizes his studies as follows:

The testes were examined in 100 cases of deaths occurring at all ages from birth to eighty-six in London asylums and various civil and military hospitals. The fluid contained in the vesiculæ seminales was examined in a considerable number of these cases, and in a few of the cases—especially dementia precox cases—the thyroid, adrenals, and pituitary glands were also examined.

The development of the testis from birth to puberty was studied in a number of cases, with the following results: At birth there is a large amount of interstitial tissue between the seminiferous tubules; the interstitial cells of Leydig are observable in great numbers and have the appearance of a gland; these cells contain a lipochrome substance like lutein and lipoid granules. At four months the tubules are twice the size; the interstitial cells are hardly visible and there are no lipoid granules seen. At eleven there is very little change in the size of the tubules and the interstitial cells are only discernible by examination with an oil-immersion lens (resting stage). There is little or no interstitial lipoid seen. There are commencing evidences of nuclear activity and karyokinetic figures, but no spermatids nor spermatozoa.

At fifteen (puberty) the tubules are closely approximated and all stages of active spermatogenesis are observable. There is abundant interstitial lipoid, and lipoid granules are seen in the cells of Sertoli, but not so abundant as in the adult.

Cases dying before puberty of chronic diseases—for example, tuberculosis, congenital syphilis, and chronic morbus cordis—show appearances of complete arrest of development of the seminiferous tubules. Probably Kyrle's view is correct, that arrested development of the tubuli seminiferi is a sign of deficient vital resistance to disease.

Normal spermatogenesis was studied in cases of death from shock caused by severe injuries. Active spermatogenesis is seen in all stages. The interstitial cells contain abundant lipoid, and the spermatogonia, and especially the Sertoli cells lining the tubules, are filled with fine lipoid granules.

Where there are sheaves of spermatozoa these granules in the Sertoli cells are less numerous. The immature spermatozoa dive into the Sertoli cells and there acquire their tails, which consist almost entirely of lipoid, lecithin, and some cholesterin.

Evidence is given to show that the lipoid granules seen in the interstitial tissue and in the cells lining the basement membrane of the tubules constitute the raw material from which the nucleic acid, necessary for active nuclear proliferation and spermatogenesis, is formed. These lipoid granules give the oxidase reaction owing to the presence of traces of unsat-

urated fatty acid. Decomposition and recomposition processes are brought about by the catalytic action of the iron of the cell nucleus upon the oxidase, causing molecular oxygen O_2 to be converted into free atomic oxygen O-O on the surface of the granules.

Reasons are given for supposing that these lipoid granules are derived from the lipoid store in the cortex adrenalis. Elliot's work, showing that the lipoid content of the cells of the cortex adrenalis is diminished in microbial intoxication, is confirmed. However much it is diminished on this account, the lipoid granules in the testes are not appreciably so. This may explain the fact, so frequently observed in this inquiry, that prolonged microbial toxemia does not arrest spermatogenesis. It seems as if the lipoid substance in the testes acted not only as the phosphorized raw material of nuclear activity, but as a protective barrier to the effects of circulating microbial poisons.

The spermatozoa in the vesiculæ seminales were observed alive and active eight hours after death in two cases, but the majority were dead. Examination of the seminal fluid from a large number of vesiculæ showed several important facts. In a healthy man the heads of the spermatozoa are stained by the basic dye, whereas in persons dying of various chronic diseases the majority of the spermatozoa are stained by the acid dye indicative of a death change. May not this indicate a survival of the fittest in the vesiculæ seminales, and a protective provision of nature? The most marked degenerative changes in the spermatozoa were found in dementia precox.

Whereas in 66 successive cases of general paralysis spirochætes were found in an emulsion of the brain, spirochætes were not once found in 50 cases in which an emulsion of the testis was examined microscopically by dark-ground illumination. This fact may be correlated with the fact that general paralytics, unless the wives are infected, have healthy children.

The testes of a large number of general paralytics, including four of the juvenile form, were examined. In not one of these cases was there a complete arrest of spermatogenesis. In many there was a very active spermatogenesis and normal staining spermatozoa in the seminal fluid. A considerable proportion of the testes, however, showed strands and islands of completely atrophied tubules amidst normal tubules. Considering that where this atrophy occurred islands of normal Leydig cells are seen, it must be concluded that the atrophy of the tubules was due to local obstruction of the vasa efferentia by gonorrhea or syphilitic inflammation. In one case of juvenile general paralysis in which the secondary sexual characters had not developed the testes were infantile in development.

The testes of 22 cases of dementia precox were examined. Three stages of regressive atrophy are described for convenience and brevity, but they all gradually merge from the earliest change in the biochemical reaction of the heads of the spermatozoa to a complete regressive atrophy of all the seminiferous tubules, so that the appearance of the organ as regards capacity for function in an adolescent was less than that observed in the decrepit dement of eighty-six. Indeed, the testes of an old dement of eighty showed more microscopic evidences of virility than any one, even of the earliest cases, of dementia precox. In one-half at least of the cases there was complete regressive atrophy. It is possible that this regressive atrophy of the testes may be correlated with a deficient vital resistance to infective disease, especially tuberculosis, from which the vast majority of these cases die.

The testes of six cases of imbecility and idiocy were examined; five of the six showed complete absence of spermatogenesis. Various other forms of mental and bodily disease at varying ages showed active spermatogenesis, in spite of the most advanced and active tuberculosis, dysen-

tery, bronchopneumonia, and gangrene of lung.

There is abundant evidence to show that whereas, on the one hand, the degenerative changes in general paralysis obvious to the naked eye in the brain are due to a chronic inflammatory reaction occasioned by spirochætal poison, on the other hand dementia precox is a primary nuclear degenerative process with no inflammatory reaction and no obvious naked-eye changes of the brain.

To the enthusiast in glandular therapeutics, not particularly concerned with the chronology of cause and effect, these studies will prove a stimulus toward the administration of particular derivatives in cases of dementia precox; whilst they incidentally serve as a basis for believing that general paralysis may yet be reached by specific treatment.

ABORTING GONORRHEA.

In the course of a lecture COLE (*Ohio State Medical Journal,* December, 1919) states that it has been found in army work that if a case of gonorrhea be seen within the first twenty-four to forty-eight hours, it is possible to entirely abort the disease in most cases. The procedure is as follows: The patient is put on liquid diet, given large amounts of water internally, and once each day a 10-per-cent solution of argyrol is injected into the anterior portion of the urethra and held there for fifteen minutes.

The secret of success in this procedure is that the argyrol must be made fresh each day. An old solution will not have the same action.

In addition to this, the patient is irrigated once or twice a day with a potassium permanganate solution one to five thousand used as hot as he can stand, the container being placed at a height of two or three feet above that of the patient's urethra.

If the disease is not entirely aborted within two or three days, this treatment should be stopped, and the case should be treated in accordance with the routine with which the practitioner is familiar.

PAGET'S DISEASE OF THE NIPPLE.

HANDLEY (*British Journal of Surgery,* October, 1919) observes that it is essential for the proper understanding of Paget's disease to know something of the anatomy of the cutaneous lymphatics.

Ranvier states that the lymphatic capillaries form simple or composite culs-de-sac. They do not reach the epidermis, but are separated from it by a distance of 1 mm. Their diameter is relatively considerable, and has an average of .04 mm.; it may attain .05 mm. These are large figures for capillary vessels, and much exceed those of the blood capillaries. No trace could be seen of the supposed plasmatic canals, juice canals, or canaliculi, which, according to certain purely theoretical ideas, form the origin of the lymphatic system. The lymphatics of the skin originate as blind finger-like culs-de-sac in the dermal papillæ. In the rat the lymphatics of origin are separated by a thin layer of dermal fibrous tissue from the deep surface of the epidermis. The finger-like processes are continued into narrower vessels, several of which unite together in the deeper layers of the dermis to form a collecting vessel which passes more or less vertically through the subcutaneous fat to join the fascial plexus.

A carcinoma starts in the smaller ducts of the breast, perhaps exceptionally from the acini or the larger ducts. Usually without producing a palpable tumor, it permeates the breast lymphatics widely. The rich plexus of lymphatic vessels around the ducts forms an especially easy and convenient channel for permeation, and the lymphatic block extends along them to the subareolar plexus beneath the nipple.

The cutaneous lymphatics about the nipple are now dammed up so that lymph cannot return from them. Later they are themselves permeated, but possibly this is not always the case. At this stage, and before any lump has appeared in the breast, the skin of the nipple and the mucosa of the ducts begin to show changes dependent upon lymphatic obstruction. The epi-

thelium shows disintegration and degeneration of its superficial layers, with proliferation of the deeper layers. These changes are nutritional and non-malignant. The dermis becomes thickened by solid lymphatic edema. The lymphatics of origin in the superficial layer of the dermis are filled with cancer cells, which are also to be seen in the lymphatics of the subareolar plexus. The permeated lymphatics now undergo the usual process of perilymphatic fibrosis; they become surrounded by aggregations of inflammatory round cells, and later by young fibrous tissue which contracts upon and destroys the included cancer cells. In most cases, at the time the disease is removed the destruction of the cancer cells has been consummated, and there is seen merely a band of round-celled infiltration in the superficial dermis, while in the deeper dermis perivascular aggregations of round cells indicate the destruction of the lymphatics which are known to accompany the blood-vessels in this layer. In other and later cases organization into fibrous tissue is complete, round cells have disappeared, the papillæ have been destroyed by the fibrous contraction which has taken place in them, and nothing remains to show that the lymphatic vessels of the dermis have been obliterated and replaced by fibrous cords, save and except the persistent changes in the epithelium and the edematous thickening of the dermis.

In regard to the changes in the large ducts, these are evidently similar in nature to those found on the surface of the nipple, and they depend upon the same cause, namely, lymphatic obstruction from permeation and subsequent fibrosis. The only difference is that the shed epithelium cannot get away, and remains *in situ*, plugging and distending the ducts with a degenerate mass of débris. Lastly, even in the rare cases in which no carcinoma has made its appearance, though the Paget's disease has lasted for many years, it is probable that an atrophic scirrhus, which may have undergone partial or complete cure, preceded the onset of the Paget's disease. But the possibility that the lymphatic obstruction in such cases is of inflammatory origin, and due to a chronic lymphangitis, cannot be altogether excluded.

From this it follows that Paget's disease calls for complete removal of the breast, the surface manipulation being usually a sign of deeper cancer involvement.

GUNSHOT WOUNDS OF THE HEAD.

JEFFERSON (*British Journal of Surgery*, October, 1919) thus summarizes a report on this subject:

In gunshot wounds of the head, as in wounds elsewhere, the prime factors are the extent of the injury, the physiological disturbance produced by it, and the incidence of sepsis.

Of the 150 cases in the series not previously operated upon, 29 died (19.3 per cent), all penetrating wounds of the dura of varying degrees. No case with an intact dura died. The mortality for penetrating wounds alone was 37.6 per cent.

With the exception of four cases which rapidly succumbed to the effects of the injury alone, all the deaths were due to infection. The inference that head wounds should be operated upon early is obvious.

The common form of infection was meningitis, produced by spread either from the site of the wound or by the medium of ventricular infection, which facilitated infection in the basal arachnoid cisterns. This latter seemed to be the commoner route, and is undoubtedly of paramount importance. Three died from cerebral abscess.

The nature of the infection is tabulated in the text. The bacteria present are much the same as in wounds elsewhere. The most deadly seems to be the streptococcus.

The importance of removing all indriven bone fragments cannot be overemphasized. Bacteriological examination of the fragments showed them to be heavily infected with both aerobes and anaerobes. An

attempt was made to enumerate all fragments and locate their depth and direction.

From the neurological side, three distinct aspects can be discerned: (*a*) Signs of generalized intracranial disturbance, increased tension; (*b*) localizing signs of cortical or projection fiber injury; (*c*) the meningeal syndrome.

The meningeal syndrome was frequently present, often with a sterile cerebrospinal fluid, which may show a physiological leucocytosis and be quite turbid but free from organisms.

Three examples of pain referred from the occipital dura to a situation behind the eyes are recorded.

VACCINE THERAPY IN GENITO-URINARY INFECTIONS.

LAIRD (*Pennsylvania Medical Journal*, January, 1920) states that vaccines are antigens, prepared by suspending the dead bodies of bacteria in salt solution, water, or oil, which when injected hypodermically cause the production of a combative antibody or amboceptor. If the infection is superficial, *i.e.*, has a poor blood supply, the amboceptor created and present in the blood does not reach the site of infection in sufficient concentration to produce a bactericidal action if the infection is systemic; the numerous live organisms infecting the blood stream supply a stronger antigen than the few dead organisms injected under the skin, and are already stimulating the infected body to produce the maximum amount of amboceptor compatible with the ability of the individual to react under the circumstances. In the deep local infection there is an ideal condition for extra stimulation of the production of amboceptor by the injection of vaccines and because of the good blood supply, the greatest facility for the amboceptor produced reaching the site of infection in bactericidal concentration.

Amboceptors are distinctly specific, not only to bacteria of a certain family but to individual members of any one family. This is a known fact and consequently is sufficient basis for the statement that the only vaccine which is dependable as a combative measure is an autogenous vaccine.

Even autogenous vaccines, moreover, must be so prepared, if efficient results are to be obtained, that the organisms themselves change as little as possible in their sojourn out of the body on artificial media and may be again injected into the body, when a mixed infection is present in the proportion in which they are existing at the site of the infection.

These two points are gained by choosing a culture medium or media on which all the offending organisms in any condition are known to grow well and, making no attempt to separate them, allowing them to grow together in their proper proportion; making only one subculture of their mixed growth in order to remove foreign protein matter from the culture and to gain a sufficient growth to make the suspension of the desired number of bacteria.

Vaccine therapy in genito-urinary infections, the most common and important of which is gonorrhea, should be governed by the principles above laid down and one added fairly well proven fact, viz., pure gonorrheal infection is essentially limited to the anterior urethra—the infection of the posterior urethra and its adnexa is always a mixed infection in which, as a cause and a means of communication, symbiosis plays an important rôle; in this symbiosis organisms other than the gonococci being the greater offenders.

If we eliminate the other pathogenic organisms from the genito-urinary tract, the gonococci remain in the anterior urethra. Anterior gonorrhea is a comparatively mild affection, practically self-limited in a period of from eight to ten weeks and causing few complications or sequelæ. If the symbiotic organisms are not eliminated, on the other hand, the gonococcic infection extends posteriorly in about 98 per cent of cases, and posterior gonorrhea is a very serious affection; if

not always vitally destructive, it is of exceedingly obstinate character against the usually hitherto practical methods of treatment and productive of extensive and profound symptoms.

Autogenous vaccines properly prepared and administered are capable of eliminating from the genito-urinary tract the symbiotic organisms, and, although probably not curative of anterior gonorrhea, are curative of the posterior conditions and capable, therefore, of holding an otherwise most serious condition to a comparatively harmless one. Autogenous vaccines are curative of the posterior condition when such is existent prior to the opportunity for their use in any case.

The foregoing statements and the following description of the method of preparation are based on practical experience in their use on hundreds of patients over a period of nine years.

As to the preparation of vaccine the culture medium employed may be nutrient beef agar slant; hemoglobin agar slant, in addition—hemoglobin obtained from the cut—on which medium the gonococcus as well as the other organisms will grow.

Cultures are made on the above medium from the prostatic secretion expressed by massage, directly after the patient has flushed out the urethra by urination, and collected from the meatus by means of a sterile pipette.

Culture is allowed to grow at body temperature for one day.

Subcultures are made on four culture tubes of the same medium and allowed to grow for one day.

To each of the four tubes 5 Cc. of sterile normal salt solution are added; the growth raised from the surface into suspension in the salt solution. The 20 Cc. of bacterial suspension are then shaken in a shaking machine for three to five minutes to make a homogeneous suspension and the count per cubic centimeter estimated. The organisms are then killed by heating in a water-bath at 60° C. for one hour. Five-tenths of one per cent of carbolic acid is added as a preservative.

Administration of the concentrated vaccine, which contains ten billion organisms to the cubic centimeter, is made at intervals of four or five days in the appropriate dilutions.

RESULT OF TREATMENT OF NEUROSYPHILIS.

Solomon (*Boston Medical and Surgical Journal,* Jan. 15, 1920) states that the only proper criterion as to the results of treatment in neurosyphilis is the condition of the patient and his ability to lead a normal life in the community. He reports on ten cases four or more years after dismissal from the hospital.

Nine of these patients were committed as insane; the remaining case was diagnosed general paralysis, but not necessarily commitable. Eight cases were diagnosed as general paralysis, two as cerebrospinal syphilis. It should be added that the diagnosis of cerebrospinal syphilis was changed from general paralysis in one of these two only because he cleared up under antiluetic treatment. The mental symptoms were those of paresis.

Of the eight cases diagnosed general paralysis, five are now living at home. Three are apparently entirely well; two while not well are able to care for themselves and live a normal life in the community. Two are dead and one is in a hospital. One of the two who died had a fair remission with economic efficiency for eighteen months, and had all laboratory reactions negative at one time. The one who was in a hospital had a remission of three years' duration. Two cases were diagnosed cerebrospinal syphilis (non-paretic), but with marked mental symptoms. One left hospital apparently entirely normal and with negative laboratory signs. He has been lost from view. The other is now serologically negative and mentally normal after four years.

Of eight cases diagnosed general paraly-

sis, three are apparently entirely well after four years; two are well enough to live outside and care for themselves; one had remission of more than three years' duration, now in hospital; two are dead, having had remissions of eighteen months each.

Of two cases diagnosed cerebrospinal syphilis with mental symptoms, one is lost from observation, the other is mentally normal and serologically negative.

This report leads the author to feel that it is possible to help a portion of cases of general paralysis or cerebrospinal syphilis with mental symptoms, and that intensive, systematic treatment will change the prognosis of general paralysis. It was not the intention to discuss the percentage of cases of general paralysis that could be helped when this report was first made in 1916, but it did represent a fair percentage of the cases that had had intensive treatment. At this time the desire is merely to bring this report up to date. It does seem encouraging, however, that the results have been so good for such a relatively long period. The majority of cases of syphilis of the nervous system, whether the so-called cerebrospinal syphilis, tabes dorsalis, general paralysis, or other forms, are entitled to treatment, and if this is carried on thoroughly, intensively, and systematically, the results will be gratifying. The form of treatment, mercury, iodide, arsenic, and the amounts, will necessarily depend upon the condition of each individual patient.

THE REPAIR OF BONE.

GALLIE and RORERTSON (*British Journal of Surgery*, October, 1919) have devoted some time to literary research and still more to the experimental study of the question of the repair of bone. Their interesting work is summarized by them as follows:

The periosteum, as viewed by the surgeon, is not osteogenetic, and should not be depended upon under any circumstances to assist in the production of new bone.

The presence or absence of the periosteum in autogenous bone transplants has no decided influence on the activity of the subperiosteal osteoblasts, and is of no practical clinical importance.

The periosteum is of great importance, however, from a clinical standpoint, because of its control of the circulation throughout living bone. Extensive stripping of the periosteum at operation will result in necrosis, which may cause delay in the union of aseptic fractures, and which will result in sequestration where sepsis is present. Disturbance of the circulation should be reduced to a minimum in all operations on bone.

Subperiosteal resections can only be performed with a reasonable certainty of restoration of the continuity of the bone where previous inflammation has caused extensive proliferation of the subperiosteal osteoblasts and commencing new bone formation.

When a piece of bone has been cut free from its circulation and transplanted to some other position in the same animal, and if its surfaces are freely bathed in lymph, those cells which are present on the surfaces and in the open mouths of the Haversian canals will live and undergo rapid proliferation. The cells in the lacunæ or deep in the Haversian canals die, and in the course of two or three weeks disappear. The proliferating cells on the surface, whether derived from the graft or from neighboring living bone, immediately commence the absorption of the graft, and do not cease their activity until every vestige of the old bone has disappeared. In the meantime, however, new bone is being laid down on the surfaces, particularly the periosteal and endosteal, and a circulation is reëstablished throughout the whole graft by the ongrowth of new blood-vessels. Along with these blood-vessels the osteoblasts also pass into the interior of the bone and rapidly continue the process of absorption. As the old bone disappears, its place is taken by fine trabeculæ of new bone. During the first two months the process of absorption goes on much more rapidly than that of replacement, so that at the end of

this period the dense bone of the graft has become more rarefied. If the graft is not subjected to any strain and has no definite part to play in the function of the area in which it was implanted, the absorptive process continues in advance of replacement, and gradually the new bone disappears and its place is taken by an ordinary scar. If the graft, on the other hand, is implanted in such a position that it is subjected to strain and has some definite function to perform, the process of rarefaction is gradually outstripped, after the lapse of two months, by the process of new bone formation, and the new bone steadily thickens and hardens until it assumes the form and density required by the work it is called upon to do.

Bone transplanted from one species into another retains no viable elements.

Bone transplanted from one animal to another of the same species may act similarly to autogenous transplants. It probably always does so in dogs and cats, but in man there is reasonable doubt as to whether the cells from all donors will live in the fluids of all recipients. Until this is cleared up experimentally, it appears wiser to avoid using any but autogenous bone, and if this is impossible, to use bone only from a donor whose blood is compatible with that of the recipient.

When heterogenous or boiled bone is placed in close contact with living bone, the resulting gross and histological changes closely resemble those which follow the implantation of autogenous bone. The cells of the living bone respond to the stimulus provided by the dead bone, rapid proliferation occurs, and the dead bone becomes securely united to the living by trabeculæ of new bone laid down on its surfaces. Active absorption by osteoblasts commences on the surfaces, and as the circulation is reëstablished the osteoblasts spread throughout the implant and continue the work of absorption as in the case of autogenous bone. At the same time new bone is laid down on the walls of the excavated cavities, so that, by the time the dead bone is completely absorbed, its place has been taken by a mesh of new cancellous tissue which is gradually changed to the density that the physiological function of the area requires.

In transplanting bone for the purpose of bridging gaps in ununited fractures, autogenous grafts only should be used, unless some certain method is discovered of foretelling whether the cells on the surfaces of bone obtained from a donor will survive in the lymph of the recipient. The importance of using autogenous bone depends on the fact that cells survive on its surfaces which are capable of absorbing and replacing it and, later, restoring the area to the required density and anatomical outline. Heterogenous and boiled bone fail because the invasion of the implant by osteoblasts from the ends of the fragments is only able to advance short distances, and the central portion of the implant slowly absorbs and disappears. Further, autogenous bone is preferable because of the assistance given by the cells of the graft in producing union of the graft to the fragments.

When it is desired to bridge short gaps between perfectly healthy bones, such as the spines of the vertebræ, boiled bone may be used with the expectation that the gap will be ultimately bridged with living bone.

When operations are performed for the bridging of gaps or for the ordinary non-union, two points in technique must be observed: First, complete immobilization of the parts must be secured until solid union of the graft to the fragments has taken place. Second, the transplants must be embedded in the fragments for a considerable distance in order that the bone-forming qualities of the periosteal and endosteal surfaces of both transplants and fragments may be enlisted to make certain of solid bony union.

The best general method of implanting the transplant in the fragments is the so-called inlay method, although the methods in which the medullary graft and the external autogenous plate are employed,

and also the method in which the graft is wedged into the fragments, may be used successfully and have advantages in special cases.

In open operations on fractures, fixation of the fragments can be readily obtained by using plates and screws made of boiled bone, or in special cases by screws alone. The advantage in using this material rests in the fact that the boiled bone unites to the fragments and is ultimately absorbed and replaced by living bone.

Asepsis is essential to success in bone implantation. The utmost care must be taken in the selection, for bone transplantations, of cases of non-union following septic gunshot wounds. Cases in which there is any probability of the presence of latent infection should not be operated upon.

TECHNIQUE OF CITRATED BLOOD TRANSFUSION.

MARBLE (*Boston Medical and Surgical Journal,* Feb. 5, 1920) observes that the transfusion of citrated blood now seems to have taken a very definite place in the surgical world. Its advantages over other methods are numerous, its therapeutic results are identical, and when carried out with careful, painstaking technique it is safe, accurate, and sure. Thousands of these transfusions were carried out in the A. E. F. with remarkably good results.

In performing citrated blood transfusions several points must be carried in mind: The recipient must be carefully typed. The donor must be carefully typed, and if time permits a Wassermann reaction done. Only donors of the same or higher types than the recipient shall be used.

Blood is a fragile tissue; the processes of coagulation begin almost instantly when the blood leaves the vein; therefore it must pass quickly, easily and cleanly into the sodium citrate solution, and be immediately mixed with it before coagulation begins.

Having obtained the blood and having carefully mixed it with sodium citrate, the process of administering it to the recipient may be carried out much more leisurely than in other methods, the problem of coagulation having been eliminated.

Although citrated blood will keep for two days, it is always well to complete the transfer as quickly as possible, and in transfusions never have more than thirty minutes elapse between the time of taking of the blood and its introduction into the vein of the recipient.

A safe rule to follow is that a recipient may receive blood from his own type or from any type higher.* Type 4 is the universal donor; type 1 a universal recipient. If known type serums for type 2 and 3 are not available, the method suggested is as follows:

Draw the blood from the recipient as for a Wassermann reaction. Allow to clot and the serum to separate. Pipette off the serum and centrifuge until clear. Add normal sodium citrate solution (3.8 per cent) in the proportion of one part to ten parts serum.

Use this as a type serum. Mix it with blood from donors as before, rejecting those that agglutinate.

In drawing the blood use a large graduated flask similar to a Vincent tube, but of a capacity of 1000 Cc., a short rubber tube which fits on to the tip of this flask, and a sharp, clean needle which of itself, or by means of a connection, fits easily into the end of the rubber tube. The needle must be clean, razor sharp, and the rubber connecting tube must be clean and smooth. There must also be a long stirring rod. In the flask are placed 50 Cc. of freshly made isotonic sodium citrate solution (3.8 per cent). The rubber connection is pinched to prevent the escape of the solution. A few drops of sodium citrate solution is allowed to flow through it, and the needle is then introduced into the vein. While the blood flows into the flask, hold the needle immobile in the vein with one hand and with the other hand hold the flask upright. After the blood flows into the flask it is stirred about with a mixing rod. To more than 500 Cc. of blood an added quantity of citrate is needful. On securing the proper

quantity the rubber tube is pinched, the needle removed, passed into the vein of the recipient and blood allowed to flow in, or if the rate of flow is too slow is driven in by air pressure, the tube for which passes through a tightly fitting cork.

THE TREATMENT OF FRACTURES OF THE FEMUR.

JONES (*Journal of Orthopedic Surgery*, January, 1920) gives an excellent summary of the treatment of fracture of the femur as practiced most successfully in the army. He notes that there can be no question that the direct pull on the bone is the most efficient way of applying traction. The method consists in weight and pulley extension applied through calipers at the lower end of the femur, which they grip but do not penetrate. The lower part of the limb is free, flexed and supported on a knee flexion splint grafted on the Thomas at the level of the knee. There is added to the Thomas splint a suspension of the ring, so that the ring of the splint rests at all times against the ischial tuberosity. This may be done by counter-weights and pulleys or by a string from an overhead bar.

The skin around the knee being already shaved, swabbed with a solution of flavine in spirit (1 in 500), and surrounded with a sterile towel, gas may be given. The application of the calipers is not difficult and is made easier if the thigh has previously been lifted well forward in the splint by tightening the flannel bands under it. Certain apparently trivial details make a great deal of difference to the subsequent comfort of the patient. The skin over the inner and outer condyles should be drawn up and slightly forward so that it shall not be tight over the patella. A cut is made with a narrow scalpel through the skin, bipp is rubbed in, and without relaxing the skin the sterilized caliper points are inserted. The skin puncture must be large enough—about an inch—to let the caliper points go through easily and not be a tight fit. And the points must go right down to the bone; any intervening piece of fascia will lessen their grip. But they should not enter the bone; still less is there any need to drill the bone. The exact site of insertion is important. With the most ordinary care as to landmarks there is no fear of puncturing the knee-joint. The available area of safety is a good deal more than the width of the thumb. At the inner side the landmarks are easily found; the cut should be made a fingerbreadth on the proximal side of the adductor tubercle, not on its tip. At the outer side the guide is less definite, but the site for puncture is proximal to the most prominent point of the outer condyle and in front of the iliotibial band. The latter, or rather its junction with the intermuscular septum, is easily felt in oneself if one stands with a leg extended straight out in front unsupported. It is not so easily felt in an unconscious patient with lax muscles and a slightly flexed knee; but it can be felt, and it is a matter of some little importance, because that band moves backward and forward in subsequent movements of the knee, and if penetrated may drag on the caliper and cause pain.

Roughly speaking the outer point of insertion is about 1½ inches from the outer border of the patella above its middle. The only common mistake in putting on these calipers is to put them too far forward, in front of the broadest diameter of the bone; they then grip a sloping surface and tend to gradually slide further forward and drag the skin—this especially on the inner side, which is the more sloping.

For any recent case, say under a week old, one ten-pound weight is ample. For older cases, if there is shortening of two or three centimeters, up to fifteen pounds may be required at first, reducing as the limb lengthens.

The weight now being on, the surgeon can relax his hold of the calipers, which will continue to hold securely as long as the pull on them is maintained. Nurses must be instructed that on no account must the weight be removed or lifted, for that

would immediately loosen the hold of the calipers and possibly dislodge them.

The efficiency of this method of extension depends upon the counter-extension of the tuber ischii pressing against the ring of the Thomas; that alone prevents the weight from gradually pulling the patient down the bed. The relative position of the tuberosity and the ring must therefore be frequently scrutinized by the surgeon; as long as the ring is suspended there should be no trouble. There is no need to tilt the bed. One must remember that the end of the Thomas is fixed to a wooden upright.

Owing to the very high mechanical efficiency of a weight pulling directly on the bone instead of sliding through layers of skin and muscle, a 15-pound weight is ample in most cases, and this is not enough to cause painful pressure of the tuberosity against the ring. In the rare cases in which pressure there is painful, slight tilting of the foot of the bed will make the patient slide away from it, ease the pressure on the tuberosity, and the counter-extension in that case becomes the patient's own body weight; practically his splint then acts as a "Hodgen" instead of a "Thomas."

If the fracture is in the upper fourth, the proximal fragment requires a position of abduction, flexion, and slight external rotation; to get the correct alignment, the leg and lower fragment must be moved into the same position. Instead of one extension post at the foot of the bed, two are put in, and a third bar clamped horizontally across the other two at any desired height, and projecting as far beyond the side of the bed as necessary, affords means of fixing the lower end of the Thomas with any degree of abduction and flexion desired, and yet leaves easy access to all parts of the patient. The position of the bone should be checked by radiography, for it is very easy to overabduct.

In spite of precedent the practice of abducting and fixing both legs is unnecessary. It is based on a false analogy with abductions of the tubercular hip. In the cases we are dealing with the alteration of position takes place at the fracture, not in the hip-joint, and abducting the leg below the fracture is simply restoring its natural line and putting it into the position of greatest ease. The patient has no inducement to "dodge" it by tilting the pelvis, and as a matter of fact he does not do so.

When union has begun the second position is adopted; the only change being that the lower end of the splint instead of being closely tied to the extension post is now swung from above by a cord, weight, and pulley, the pulley being fixed to the top of a spare derrick or other overhead suspension at the foot of the bed. This allows the patient greater freedom of movement. At this stage the weight extension in the line of the thigh is necessarily done away with and its place taken by elastic or spring extension inserted between the hexagon and the end of the splint. A very handy and efficient form of a spring extension is a small spring balance; a glance at the indicator shows at once whether it is doing its duty and what its pull is. Its efficiency depends entirely upon the counter-pressure of the tuber ischii on the ring, and this must be maintained.

The patient becomes more convalescent and his femur less and less dependent upon extension apparatus. His knee and ankle are kept mobile throughout, and long before the thigh is able to bear the patient or indeed any weight on it, he is able to get up and walk about on the Thomas walking caliper splint, with the special light boot supplied.

The advantages of calipers as a means of extension are so manifest, their mechanical efficiency and directness, the freedom of all the leg and joints below the fracture, the fact that they can be applied irrespective of the position or size of wounds of the thigh (very satisfactorily even through an open wound), the absence of blistering of the skin—all of these look so ideal that it is well to find out their disadvantages and limitations.

Pain is present for the first day or two, sufficiently to make it worth while giving

a hypodermic of morphia gr. ¼ before administering the gas. In most cases there is no further pain worth mentioning, and patients often keep their calipers on for 12 or 14 weeks and say they are hardly conscious of their presence. In a small minority there is pain, even severe pain, at some stage or other, and then generally due to some error of technique.

Too small a skin incision may result in causing a "pressure leucocytosis" and retention of a drop of sterile pus under the skin. Movement of the skin will generally release this.

Wrong placing of the points—too far forward, where they have a tendency to slip further forward, or too close to the top of the adductor tubercle, which seems to be a sensitive point—may give trouble. If no cause can be found and pain is really severe gas should be given, calipers withdrawn, and a new pair inserted through fresh punctures half an inch higher up. As a general rule caliper extension is much less painful than is glue extension.

Penetration of the bone should not occur with the form of caliper furnished with a screw check-bar.

Sepsis, or rather the fear of it, has been a great bogey. Anything more than the pressure leucocytosis above referred to does not occur, and that is easily controlled. Calipers in any form are unsuitable for transport purposes.

There is no difficulty about the healing of the wound when calipers are removed. It is generally closed and dry by the third day and remains so.

Involvement of the knee-joint in the fracture is usually a bar to the use of calipers, and for two reasons: distention of the synovial cavity by fluid lessens the space available for insertion of calipers and might cause risk of puncture of the joint; and also where there is sepsis in a splint between the condyles pressure of the caliper points toward each other would tend to shut in this sepsis.

Riadiography should be very freely employed and in the ward, using a portable trolley apparatus. In the first week or two this may be necessary several times; in later stages less frequently. Once in two weeks is a fair average throughout. A. P. and lateral views serve well. The plates used are 12x6. From them, with the help of a reducing lantern and camera, a small positive print is made. These reduced prints should be kept at the bed head of the patient, the series forming a radiographic history of the case as well as being a constant reminder of the nature of the deformity to be corrected.

LIGATURE OF THE INTERNAL ILIAC ARTERY AND GYNECOLOGICAL OPERATIONS.

MASSART (*New York Medical Journal*, Jan. 17, 1920) thus describes the accepted technique by which this operation is performed. He notes that in all abdominal hysterectomies it is much more natural to ligate this artery after having sectioned the superior portion of the broad ligament and so cleared away from each side the tube and the ovary. All of the superior portion of the broad ligament is opened, and it is through this breach that the operator reaches the point of origin of the internal iliac artery. Considerable light is added to the operator's field if the uterus is drawn to the side opposite to that on which the ligature is made. Forceps are used to grasp the posterior fold of the broad ligament, which is drawn upward and backward. The cellular tissues at the base of the broad ligament are separated with the finger to the point where the pulsations of the artery may be felt. During this maneuver one can see the ureter, which, passing through the posterior fold of the broad ligament, is drawn away. The ureter is used as a guide, for the contractions can be perceived. It is drawn backward and slightly outward toward the wings of the sacrum, where the bifurcation of the common iliac artery is encountered.

The artery is separated by means of a grooved director, and a ligature is passed about the artery upon a long-handled and

extremely curved needle. It is useless to draw the ligature too tightly. The only demand made upon the ligature is the causing of a transitory anemia for the field of operation, and it has little importance otherwise. Ultimately the lumen of the vessel will regain its original form and function.

The method of fastening the tube and the ovary to one side is most convenient when operating in the ovarian region. If this is not done they tend to fall back and obscure the operative field. It is also the most rapid procedure, for the essential parts are never lost sight of during the course of the operation. This is an important point, as it is essential that a clear field be maintained from the beginning to the very end of the operation. In making the ligature the ureter is isolated.

The greatest difficulty is encountered in extremely obese women and in women with narrow pelves. This difficulty, however, is the same no matter what technique is employed. These obstacles are overcome by the use of the long needles and dissecting forceps devised by Professor J. L. Faure. This technique is similar to that employed by Altuchoff for the ligation of the uterine artery at its point of origin. The procedure which he described in 1896 consists of discovering the uterine artery in the ovarian fossa and opening the broad ligament between the fallopian tube and the round ligament.

But the opening of the entire superior portion of the broad ligament, in putting aside the fallopian tube and the ovary, resembles the technique just described, greatly simplifying the discovery of the internal iliac artery.

During this ligation two things to be avoided are injury to the iliac veins and ligation of the ureter. The iliac veins may be injured when the needle is passed about the artery, but it is to be noted that this accident rarely occurs; it is not extremely difficult to separate the cylindrical artery from the flattened vein.

The ureter may be fastened in two ways: (1) The ureter may be bound into the ligature with the artery. This may be avoided by isolating the artery and following it a step at a time in the center of the ligature. (2) The ureter may be confounded with the artery. Neither in its caliber, shape, nor direction does the internal iliac artery, the pulsations of which may be seen, resemble the ureter. In addition the course of the artery is short and has but little movement, while the ureter is long, flexible, mobile, and remains adherent to the posterior fold of the broad ligament. In making the ligature according to this technique it may be done in the same way on either the left or right side, and the insertion of the sigmoid mesocolon need not complicate the operation since it is not fastened to the wall of the posterior peritoneum.

BRACHIAL BIRTH PALSY.

THOMAS (*American Journal of the Medical Sciences,* February, 1920) concludes an article on this subject as follows:

Obstetrical or brachial birth palsy represents only one phase of a much larger shoulder-joint problem. Almost if not all shoulder-joint injuries are associated with a brachial paralysis; palsy or weakness of varying degree and duration. Very rarely will an actual nerve rupture be associated with the paralysis.

The best evidence of the absence of such a nerve rupture is the almost uniform and gradual disappearance of the paralysis. This is easily proved in connection with the adult cases, and seems to be true of the obstetrical cases, in which the paralysis is usually of longer duration and more difficult to follow up. If the crippling of the limb persists into adult life it will probably be found in all cases that a posterior dislocation of the shoulder is associated often with some moderate permanent disturbances in the elbow-joint.

In the obstetrical paralysis seen after birth there is a profound and almost if not complete paralysis of the whole limb, and not a paralysis limited to the small Duchenne-Erb group of muscles. This extensive paralysis is best explained by the in-

clusion of the branches of the brachial plexus in an axillary inflammation consequent upon a birth injury of the shoulder-joint.

The extravasation into the axilla of blood and synovial fluid causes an immediate inflammation and later cicatricial tissue, all of which is probably absorbed in time, thus accounting for the disappearance of the paralysis. Such a pathology has been well established by operative and post-mortem findings in the obstetrical and adult cases.

The Duchenne-Erb localization of the paralysis by electrical reactions to the deltoid, biceps, brachialis anticus (Duchenne and Erb), infraspinatus (Duchenne) and supinators of the forearm (Erb) has been widely accepted but not corroborated.

In his first four cases Duchenne found posterior dislocation of the shoulder, which he said occurred at birth and was chiefly responsible for the paralysis. He thought, however, that some of the paralysis was due to injury of the brachial plexus. In four later cases he did not find dislocation of the shoulder in any and attributed the paralysis entirely to injury of the brachial plexus. Since then practically nothing has been said of a shoulder-joint origin, the dislocations passing unrecognized, and all cases being attributed to injury of the brachial plexus. Since 1911, when the shoulder-joint injury was offered as the primary cause, this theory has made rapid progress.

It is very likely that sufficient traction on the head at birth to rupture the brachial plexus has never been applied in a successful delivery.

PRESENT-DAY PROBLEMS IN OBSTETRICS.

Williams (*Modern Medicine*, December, 1919) holds that it may be stated as an axiom that the ideal of the practice of obstetrics should be the attainment in every case of the four following conditions: (1) a living mother; (2) a living child; (3) a child normal in every respect and free from injury or disease; and finally (4) a mother left in good health and able to take her part in the world as well as before her confinement.

The statistics of the Metropolitan Life Insurance Co. for the year 1916 show that among more than two and three-fourths millions of women of the child-bearing ages (15 to 44) among its policy-holders there were 1769 deaths from diseases and conditions incident to childbirth. Puerperal infection was responsible for 41 per cent of these deaths; conditions characterized by albuminuria, including both toxemias and chronic nephritis, caused 29 per cent; accidents of labor accounted for 10 per cent, hemorrhage for 8 per cent, and abortions and miscarriages also for 8 per cent, of the deaths; miscellaneous causes made up the rest.

Harrar collected the statistics for 100,000 cases of labor from the records of the New York Lying-in Hospital, including both indoor and outdoor departments.

In the outdoor department, among 69,081 cases there were 218 deaths, or 0.31-per-cent mortality. In the indoor, among 23,130 confinements there were 109 deaths, or 0.47-per-cent mortality among the regular patients of the clinic; but in the emergency cases sent in by physicians from outside the hospital the maternal mortality rose to 5 per cent. Here again puerperal infection heads the list, being the cause of death twenty-three times in the indoor clinic, and fifty-nine times in the outdoor department. Eclampsia and albuminuria again ranked second, with 10 deaths in the indoor and 26 in the outdoor patients. Peritonitis following Cæsarian section caused 16 deaths, which should be added to those above given for sepsis.

DeLee states that in the registration area of the United States 10,518 women died from childbirth during the year 1914; at least 4664 of these died from puerperal infection. Lobenstine quotes the death-rate from childbirth in the United States as 14.9 per 100,000 of total population. No small part of the incidence of infection is due to the failure to carry out well-known and commonly understood aseptic methods, such

as shaving the vulva, adequate scrubbing before every examination, avoidance of unnecessary examinations, etc. He gives an excellent discussion of these methods of transmission. He found that the least number of postpartum fevers occurred in patients cared for at home; the next smallest number in those cared for in a hospital limited to clean maternity cases; and much the largest number in those delivered in general hospitals. The aseptic technique was the same in all cases.

The occurrence of epidemics of infection in lying-in hospitals is a well-recognized fact. Therefore it is not sufficient simply to maintain excellent aseptic technique in the delivery room. The patient must be guarded from exposure to possible sources of infection before and after delivery as well. Among the less common sources of infection which must be recognized and guarded against are the entrance of dirty water in the vagina during the bath, coitus during the last weeks of pregnancy, transmission of pyogenic organisms from a focus elsewhere on the patient's own body, contamination from infected bedpans, bedclothing, or mattress.

As regards the treatment of puerperal infection recent literature is barren. In the past nearly every conceivable form of surgical intervention has been tried: curettage, instrumental and digital, incision of the posterior cul-de-sac followed by packing with iodoform gauze, ligation of the internal iliac and ovarian veins, and even hysterectomy. Practically all these procedures have been abandoned, and the surgery of puerperal sepsis is to-day limited to the evacuation of localized collections of pus.

Following the failure of purely surgical methods there came an era devoted to attempts to reach the infection by systemic measures. The intravenous use of silver salts, bichloride of mercury, formalin, magnesium sulphate, and latterly arsenobenzol, have all been tried. Antistreptococcic serum, vaccines, and, more recently, transfusion have been employed, but without success. The bad results of many of these methods of treatment has caused a great wave of conservatism to sweep the obstetrical world, and attention is now limited to increasing the patient's natural powers of resistance. The outdoor treatment of puerperal infection which was first advocated by Stone of New York, Young of Boston, and later by DeLee, has a decided value. At the Boston City Hospital, following the introduction of the outdoor treatment, the mortality of puerperal infection was reduced one-half.

If the present conservative methods fail to save a certain percentage of the cases of puerperal infection, there is little doubt that many of the measures enumerated, especially the surgical procedures, have increased rather than diminished mortality in the past. One of the hardest things an obstetrician has to do is to refrain from active treatment in a case of puerperal infection when he is convinced that active measures can do only harm. The family demand that something be done, and are satisfied if something is being done even if it takes away the patient's only chance. Only the most conscientious firmness and the greatest moral courage on the part of the obstetrician are sufficient to keep him from being driven into some injudicious surgical interference against his better judgment by the importunities of the patient's family.

Eclampsia and allied conditions constitute the second most common cause of death in childbirth. Nevertheless there has been a great reduction in the mortality of these conditions. In 1906 Williams quoted the maternal mortality of eclampsia as 20 to 30 per cent. These figures were certainly conservative for the lines of treatment followed at that time, which consisted of two extremes: the Stroganoff treatment with morphia in large doses and no attempt at delivery; and the accouchement forcé with its high percentage of shock and rupture of the uterus. Young, for the Boston City Hospital, shows a reduction from 36-per-cent mortality for accouchement forcé to

about 25 per cent for cases treated by the induction of labor by the Voorhees bag.

There is one fact in connection with eclampsia which has been established beyond all question: that the condition is due directly to the presence of the fetus in the uterus, and that removal of the fetus always results in a cure unless death is due directly to the operative procedure by which the fetus is delivered, or unless a sufficient accumulation of toxins has already taken place in the maternal system to cause death even if the absorption of further toxins is prevented.

Only two methods of delivery need be considered seriously: the induction of labor by bag or bougie, and abdominal Cæsarian section. A very small percentage of cases may perhaps be better delivered by vaginal Cæsarian, but this does not enter into competition with the first two as a routine method. Unfortunately, no one operator has reported any considerable number of personal cases of eclampsia delivered by Cæsarian section, and the author's statistics are all therefore composite, based upon the experience of a number of operators. Peterson collected reports of 283 recent cases of Cæsarian section for eclampsia with a maternal mortality of 25.79 per cent. At first sight it would appear that Cæsarian section does not compare favorably with bag induction as a means of delivery, but when considered more carefully it is apparent that there are certain types of cases in which better results are to be expected from Cæsarian than from the induction of labor. These types would be: (1) Where age or pelvic contraction would lead one to expect a difficult delivery by the natural passages; and (2) where extreme haste is necessitated by the rapid progress of the toxemia. It is probable that the future will result in a sharp delineation of the boundaries within which lie the indications for each procedure.

Next in importance to sepsis and eclampsia as a cause of maternal death from childbirth come the accidents of labor, especially rupture of the uterus. Only better obstetric training, and more careful conduct of labor, can be expected to reduce the incidence and therefore the mortality of these unfortunate mishaps. Next in frequency comes hemorrhage, especially hemorrhage from placenta previa. There is a marked similarity in the obstetrical treatment of placenta previa and eclampsia. In both instances delivery of the fetus from the mother is the foundation of treatment. In both conditions the same methods of delivery enter into competition, namely, induction of labor with bag and Cæsarian section, save that in placenta previa a third method, Braxton Hicks's version, has also to be considered.

RADIUM IN FIBROMATOSIS OF THE PENIS.

Loucks (*Urologic and Cutaneous Review*, February, 1920) reports the case of a physician aged thirty-seven, suffering from induration expressed in the form of three rounded surfaces apparently located on the inner side of the left corpus cavernosum within its fibrous sheath, to the left side of the septum. It was fully an inch in length and a quarter of an inch thick. The upper border had a sharp edge and lay just beneath the skin.

The erections were painful and accompanied by distortion. Under radium treatment the nodule practically disappeared.

The second case, twenty-one years old, showed a two-inch-long induration, painful on erection. Radium treatment, using from 50 to 100 mgms., accomplished a cure.

The author quotes Adami to the effect that the underlying condition is a lymph lesion, and early specimens show well-marked lymphangiectasis and obstructive dilatation of the lymph vessels and spaces, this being followed by fibrosis.

REVIEWS.

SYMPTOMS IN THE DIAGNOSIS OF DISEASE. By Hobart Amory Hare, M.D., B.Sc. Eighth edition, thoroughly revised. Illustrated. Lea & Febiger, Philadelphia and New York. 1920. Price $6.00.

The Preface to the eighth edition of this book reads as follows: "Laboratory investigation, by the brilliancy of its results in obscure cases, has served to divert attention from the careful study of the patient, which is usually the chief method by which a correct diagnosis can be made. The well-trained physician carefully notes the symptoms, gives to each its proper value, and, if need be, makes his laboratory investigations afterward. If the laboratory technique is beyond his skill, as it often must be, he calls to his aid some one qualified to provide the knowledge he seeks, and if he fails to do this when it is essential, he is not a careful practitioner. As laboratory diagnosis is now so highly developed that it requires special books for its adequate description, the author has omitted laboratory methods from his text, desiring to lay special emphasis on symptomatology, and therefore this volume is essentially devoted to a plan whereby a recognition of symptoms will lead the physician to a diagnosis. To accomplish this the symptoms used in diagnosis are discussed first, and their application to determine the character of the disease follows. Thus, instead of describing locomotor ataxia or myelitis, there will be found in the chapter on the Feet and Legs a discussion of the various forms of loss of power in the legs, so that the physician who is consulted by a paraplegic patient will be able readily to reach a diagnosis. In the chapter on Cough and Expectoration it is pointed out that hemoptysis may be due not only to pulmonary tuberculosis, but also to cardiac valvular disease, to pulmonary infarction, thoracic aneurysm, bronchiectasis and purpura, and these facts lead to differentiation. So, too, in the chapter on Vomiting, its significance, both local and remote, is discussed. In other words, this book is written upon the plan which is actually followed in practice, namely, the upbuilding of a diagnosis by grouping the symptoms. Under the older methods the reverse of this plan was followed, whereby the physician was compelled to make a suppositive diagnosis and then turn to his reference book to compare the symptoms of his patient with the text dealing with the supposed disease. If the description failed to coincide with the symptoms of his case he was forced to make another guess and read another article. That the method herein employed has proved useful is indicated by the fact that an eighth edition has been called for."

MEDICAL CLINICS OF NORTH AMERICA, January, 1920. W. B. Saunders Company, Philadelphia, 1920.

This issue of these "Clinics" is entitled the Boston Number. It contains seventeen clinics by various Boston physicians, of whom the best known are possibly Dr. Christian, Dr. Joslin, and Dr. Ford. The subjects are widely distributed through the realm of medicine, from Defects in Membranous Bones, Exophthalmos and Diabetes Insipidus, by Dr. Christian, to the Treatment of the Psychoneurotic, by Dr. Cobb.

As in previous issues the type is unusually large and well spaced and, therefore, is easily read. To those physicians who prefer this method of medical information over and above that which is found in current medical journals or in standard textbooks, this issue of the Medical Clinics of North America can be highly recommended.

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY. Revised and edited by Arthur Robinson. Seventh edition. Volume I, illustrated. William Wood & Company, New York, 1920. Price $4.00.

That seven editions of this Manual of Practical Anatomy should have appeared since 1896 is a tribute to its usefulness. In

the present edition the first volume is devoted to the anatomy of the upper and lower extremities. The general text has been revised and many new figures representing dissections, sections, and radiographs have been introduced. Instructions for dissections have been printed in a distinctive indented type, and in many instances have been rewritten and in some cases amplified. Volume II will contain the anatomy of the thorax and abdomen; Volume III, that of the head and neck.

The advantage of this particular Manual is that it is of small size, yet in good print, and is not as bulky and cumbersome for the use of the student and practitioner as are the very large volumes which are very properly employed as standard text-books.

NOTES AND QUERIES.

THE PRIVACY OF VENEREAL CLINICS.

The *Lancet* of January 17, 1920, in an editorial under this heading, calls attention to a divorce suit which ended in a decree nisi against the defending husband, and has brought to public notice in a particular manner the position of the medical witness. Against the defendant, who made no defence, adultery was proved, the act of cruelty being the communication of syphilis to his wife. To prove this, the physician under whose care at the venereal clinic of the Westminster Hospital the petitioner had been, was called under subpena. The physician demurred at being sworn, and handed to the judge a letter from the chairman of the Venereal Diseases Committee appointed by the House Committee of the hospital, stating that in adopting the national scheme for dealing with venereal diseases the House Committee proposed to abide by the statutory regulations enjoining absolute secrecy on the medical man in regard to patients attending venereal clinics. The Justice, however, ruled that higher considerations than those which prevailed in regard to the medical profession made it necessary for the attending physician to give evidence, when it was elicited that the petitioner was only known at the hospital clinic by a number, but that the witness could identify her personally. No further questions were asked, and the case terminated as stated.

The case is of great importance to medical men, to the public, and to all actively engaged in the attempt ultimately to stamp out venereal diseases. If the absolute secrecy which has been promised in regard to their cases to all who attend venereal clinics can be violated at all, however high the reason, the public resort to these clinics may diminish. And yet all medical hope of the practical control of venereal diseases depends upon the fearless use by the public of treatment centers. The Justice's action in a very difficult situation seems to demand an alteration of the law.

A CORRECTED RECIPE FOR BURNS.

In our issue of March 15, 1920, we printed in the Progress columns, page 193, a formula from an article in *Modern Medicine*, for the treatment of burns. The editor of *Modern Medicine* has been kind enough to forward the following note:

> Attention is called to the following correction in the prescription of the second ointment given in the "Treatment of Burns," by Dr. W. Irving Clark, Jr., in the November issue of *Modern Medicine*. It should have read as follows:
>
> | | |
> |---|---|
> | Vaselin | 20. |
> | Lanolin | 20. |
> | Antipyrin | .60 |
> | Boric acid | .60 |
> | Salol | .20 |
> | Iodol or iodoform | .20 |
> | Phenol | .20 |
> | $HgCl_2$ | .02 |

It will be seen that all the ingredients after the first two should be in decigrammes instead of grammes, with the exception of the last, which was correct.